ENGINEERING NEWS-RECORD

MPM&R: Fifty years in foundations p.110

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STEVENS RICE
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TOWERS OF STRENGTH
Thanks To Concrete

The $90 million Throgs Neck Bridge, a two-mile-long, six-lane span over New York's East River, will serve as a vitally needed link in the Interstate Highway System when it is completed early in 1961. The bridge and its approaches are rising on foundations, anchorages and piers of concrete. Penn-Dixie cement has been used for this great project by the contractors listed below.

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Setting the headers. Slab piles have 18-strand pattern.

Galveston Seawall Piles have backbone of Bethlehem Strand

Showing storage of piles, prior to placement in seawall.

Bethlehem ⅜-in. Stress-Relieved Strand is used in an 18-strand pattern in the slab piles of the new Galveston Seawall. Cast for the U. S. Army's Corps of Engineers by the Hi-Stress Division of Anchor-Wate Company, Almeda, Texas, the piles are 30 ft long, 36 in. wide, and 8 in. deep. The initial stress induced was 14,000 lb per strand.

You can rely on Bethlehem Stress-Relieved Strand for a variety of construction applications. Uniform in its mechanical properties, it fulfills every requirement of ASTM Specification A416-57T. For full details, call the nearest Bethlehem sales office.

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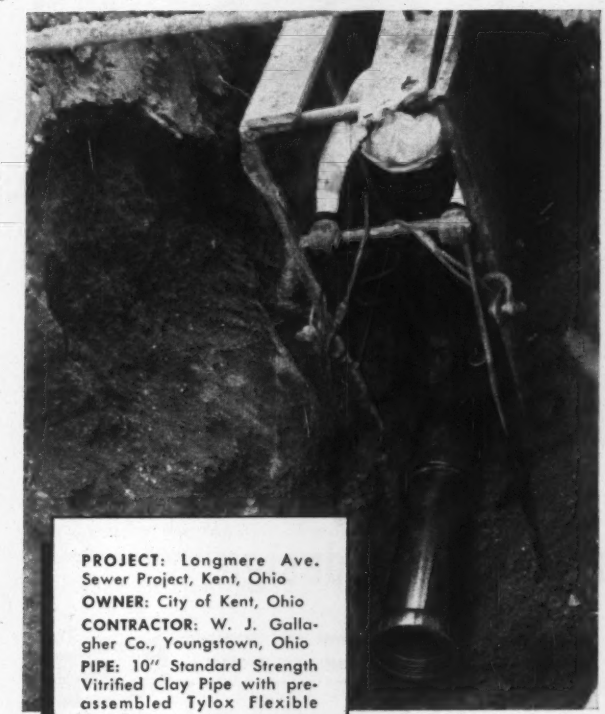

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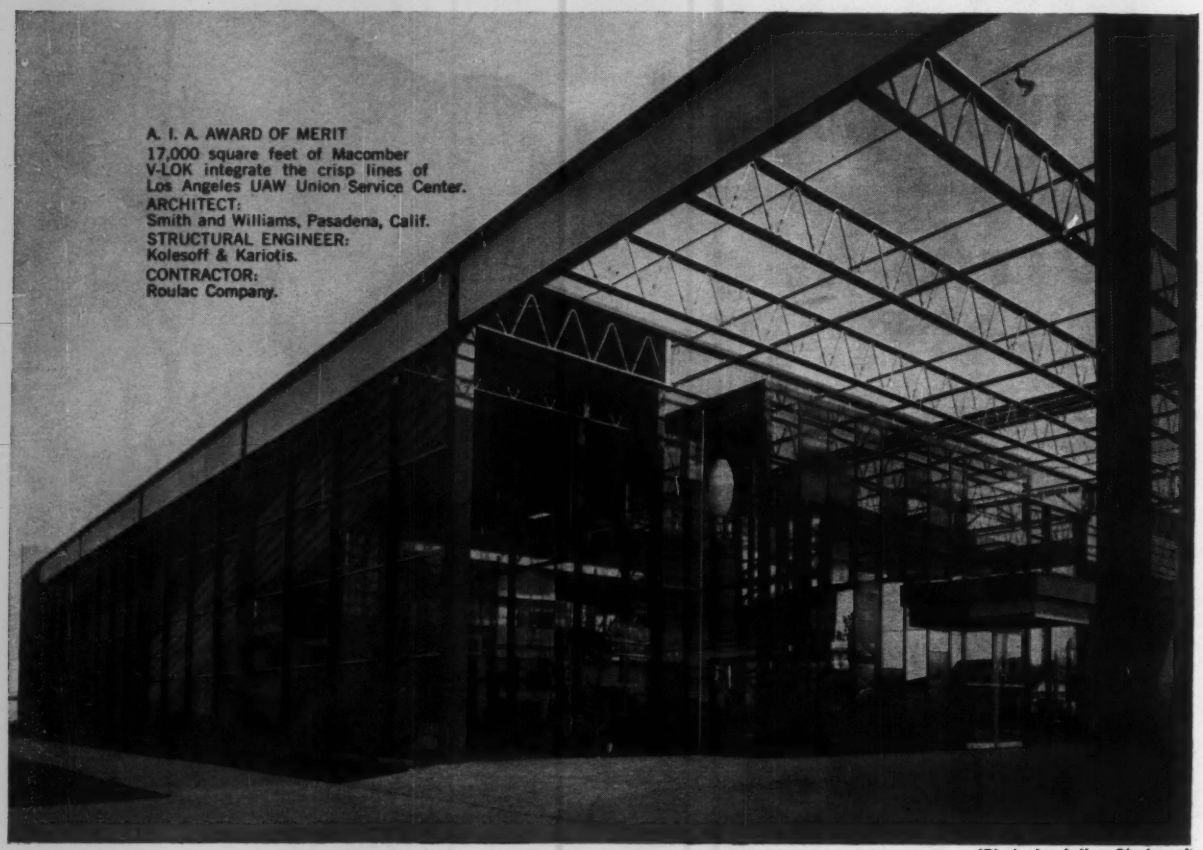
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(Photo by Julius Shulman)

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MADSEN 50th ANNIVERSARY

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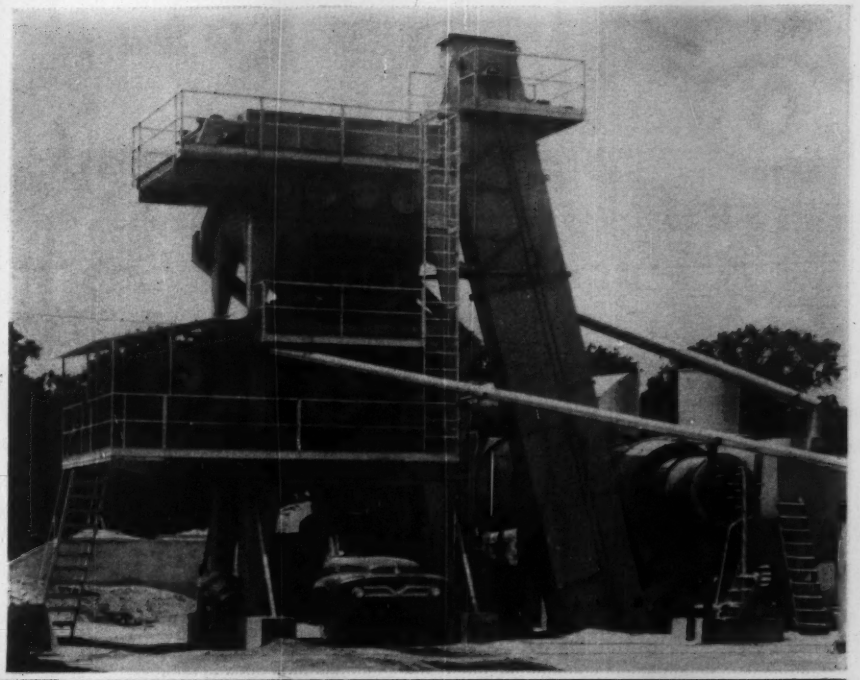
MADSEN
MODEL 391
HOT-ROD
ASPHALT PLANT

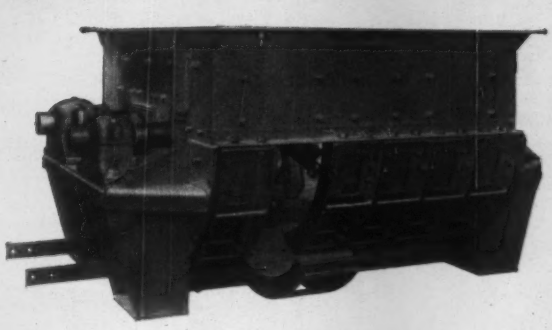


"WE GET A PERFECT MIX IN 29 SECONDS"

... says I. L. Croft & Son, Inc.
SAUGUS, CALIFORNIA

"We like a lot of things about our MADSEN HOT ROD Asphalt Plant"... says Mr. Croft, "and on a recent job on U.S. Highway 466 northwest of Mojave, California we learned about the money-making ability of this MADSEN 4000-lb. Plant. Mixing approximately 29,000 tons of Type B mix to strict California State Highway Department Specifications, we turned out 4000-lb. perfectly-mixed batches in 29 seconds. In one 8¾-hour day we mixed 1842 tons. We consider the MADSEN Twin-Shaft Pug Mill Mixer the fastest and most efficient mixer in the industry."

Designed to meet today's fast-moving industry, the MADSEN HOT ROD has no extras, no "trimmings"... just the essential components for fast output. Unit construction means easy set up and dismantling. Other MADSEN advantages include: fully enclosed (running in oil) gear box reduction unit, triple discharge bin gate openings (Pat. Pending), all air operation, and choice of automatic or semi-automatic operation.



Faster, more thorough mixing in the MADSEN Twin-Shaft Pug Mill Mixer is due to: (1) the general contour of the mixer, (2) the patented shank design, (3) pressure mixing through the arrangement of the paddles and, (4) the extra large discharge gate.

The MADSEN Asphalt Pressure Injection System with new rotating distribution bar (Patented) injects the asphalt into the mill quickly —cuts it off sharply to further improve mixing and reduce mixing time. Precision-ground liner segments may be quickly and easily removed and installed *externally* without field modification.

See your MADSEN Distributor for the complete story on the MADSEN Model 391 HOT ROD Asphalt Plant... ask for Bulletin No. 391.

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"WE CAN AVERAGE AN EXTRA LOAD A DAY... MAKE $45 TO $50 A DAY MORE WITH THIS CHEVY THAN WE CAN WITH THE OTHERS."

That 60 Series middleweight you see works for J. E. Fox, North Carolina logging contractor. Bobby Fox, a partner in the business, will tell you how much more money a Chevy can make. And how much more it can *save* with its big Jobmaster 6 engine getting as much as 14.8 miles to the gallon. That's just one of the reasons the Foxes wouldn't drive anything but a Chevrolet into the woods. "We hit stumps and potholes you'd think would tear a truck to pieces, but it doesn't hurt our Chevy. The cab is tight, the truck brakes like an automobile, and we're getting extra good tire life. As far as I'm concerned," Bobby Fox adds, "it's the only truck for this kind of work."

■ Get a 6-cylinder engine that can handle big-tonnage loads and you've got your overhead down where it's no bother at all.

That's the reason you see the big 261-cu.-in. Jobmaster 6 in so many hard-working middleweight Chevrolets. This engine's been building up a reputation over the years as the workhorse of the industry. Its valve-in-head design is dedicated to dependability. Built to turn out an efficient 150 horsepower (with a high 8.0 to 1 compression ratio) and get the most out of every gallon of gas while serving up plenty of load-pulling power.

As Bobby Fox describes it, "That 6-cylinder engine really performs. It's got the lugging power we need in the woods and walks right along with a full load on the highway."

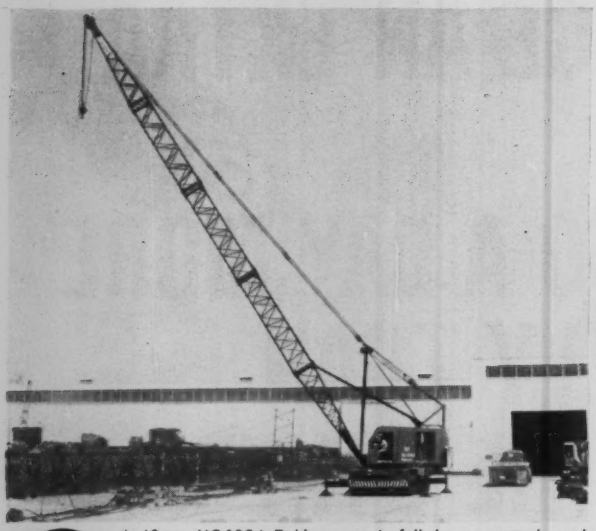
The thing to do is drop in on your dealer and check the Jobmaster specs in detail. At the same time you can get the dope on Chevy's *new* work-saving Powermatic transmission. It's now available in Series 60 through 80 models. Talk engines, models, capacities, everything. Just be sure to save some time for a trial run in a '60 Chevy. Honest to gosh, you've never in your life driven a truck like this one. You'll see why drivers are praising it to the sky. You'll see why cargo damage is a pain of the past. You'll see why so many Chevy truck operators are able to get more work done in a day. And why the trucks are able to go thousands of more miles before trade-in time. Make it soon. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

1960 CHEVROLET STURDI-BILT TRUCKS

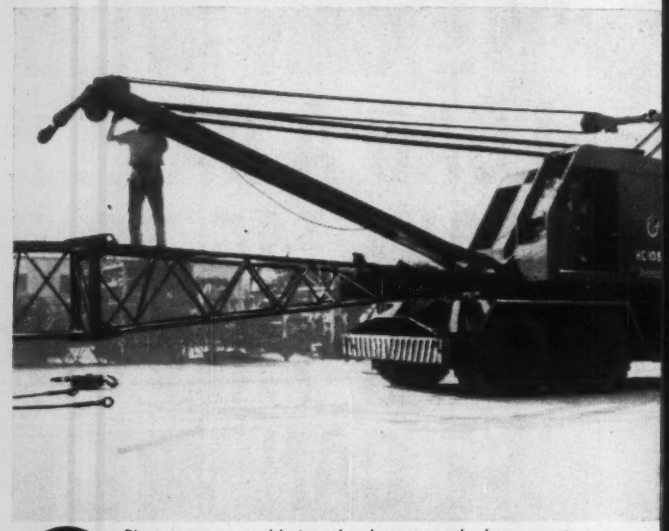
CHEVROLET

Only with Link-Belt Speeder truck-cranes . . .

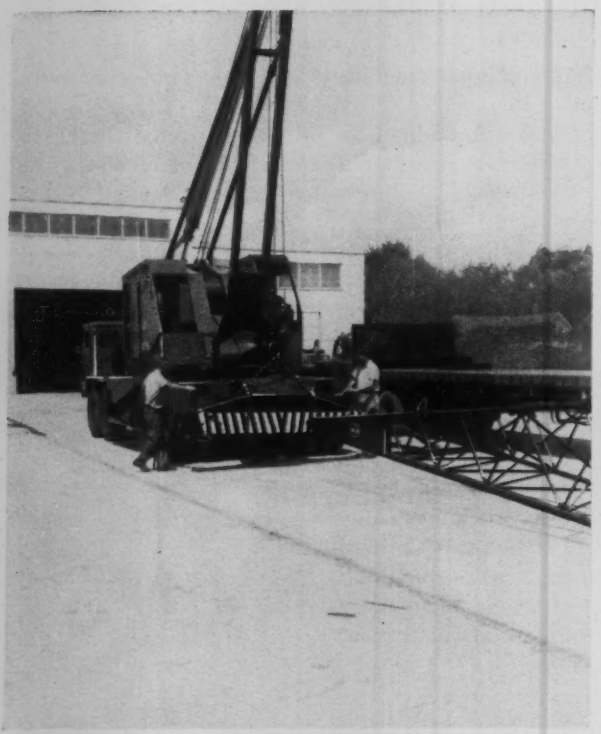
45-minute strip-down—



9:00 a.m. A 40-ton HC-108A Zephyrcrane in full dress . . . ready and waiting to strip-down for travel to new job. It has 100 feet of tubular Hi-Lite boom, boom gantry, telescopic boom backstops, front-rear outriggers with screw jacks and pontoons, and hydraulic counterweight removal jacks.



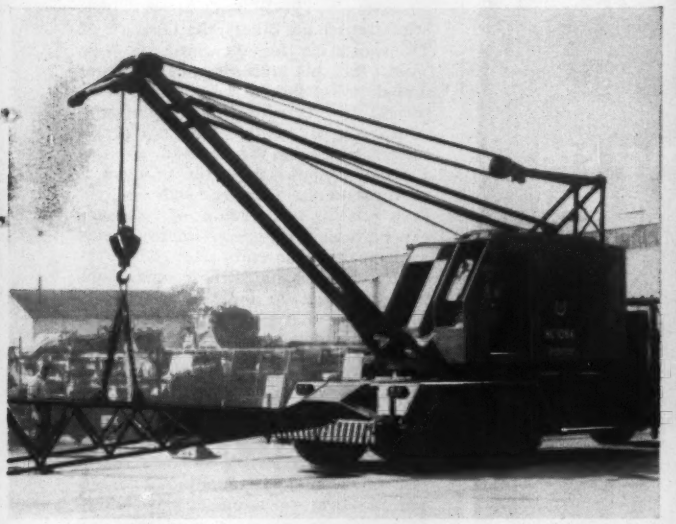
9:07 Rigger reeves a cable into the sheaves on the boom gantry, converting it to a short 20-ft. lifting boom. (Boom gantry is normally used to provide a higher angle support for main boom.)



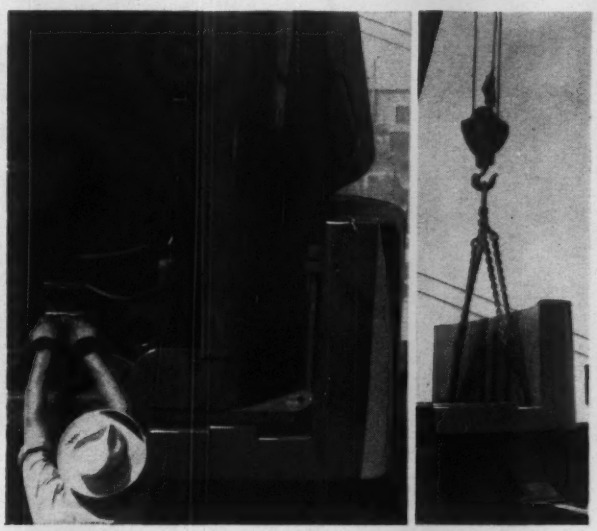
9:30 Now the complete rear outrigger assembly, including the screw jacks and beams, is removed by the boom gantry and placed on the flat-bed truck. Again, this is a fast operation, completed without an auxiliary crane.

9:40 Connecting pins are quickly tapped out of the boom while outrigger is being removed. The boom is loaded section by section on the flat-bed truck. This completes a job in minutes that usually takes half a day.

no auxiliary crane needed!

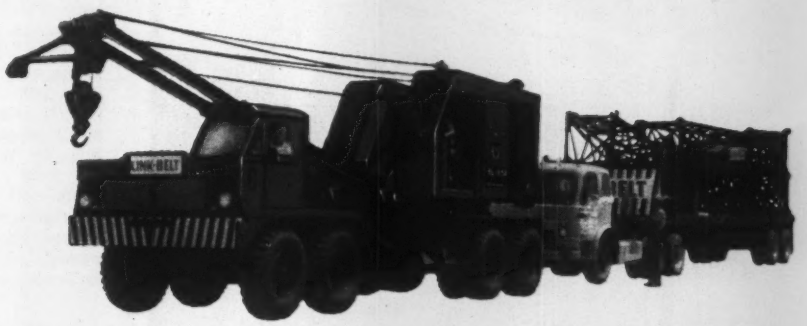


9:15 Entire boom is quickly removed in one piece. Boom gantry lifts boom to remove the boom hinge pins. Operator drives forward, simultaneously lowering boom to the ground. After this operation, the retractable high gantry is lowered for minimum clearance.



9:22 Removing the counterweight is next major step. It is first lowered by the crane's hydraulic jacks to the truck frame. The operator then swings the upper around and with boom gantry lifts and spots counterweight on hauling unit.

9:45



. . . Ready to travel. A 35 or 40-ton Link-Belt Speeder truck-crane with 100 feet of Hi-Lite boom . . . rear outrigger, counterweight and boom loaded on flat-bed truck.

Highball to your next job while other rigs are still shedding weight. Spending long hours to strip down a truck-crane costs you plenty — in men, machines and profits. Why tie up your productive forces? Only Link-Belt Speeder's *less-than-an-hour* strip-down slashes your costs with fewer men and without the extra service-expense of an auxiliary crane. *Reassembly* is nearly as fast. Only minutes longer with booms and jibs up to 200 feet.

Your distributor will detail many more great features of the 35-ton HC-98A and 40-ton HC-108A. Or write, LINK-BELT SPEEDER CORPORATION, Cedar Rapids, Iowa. 113-59N

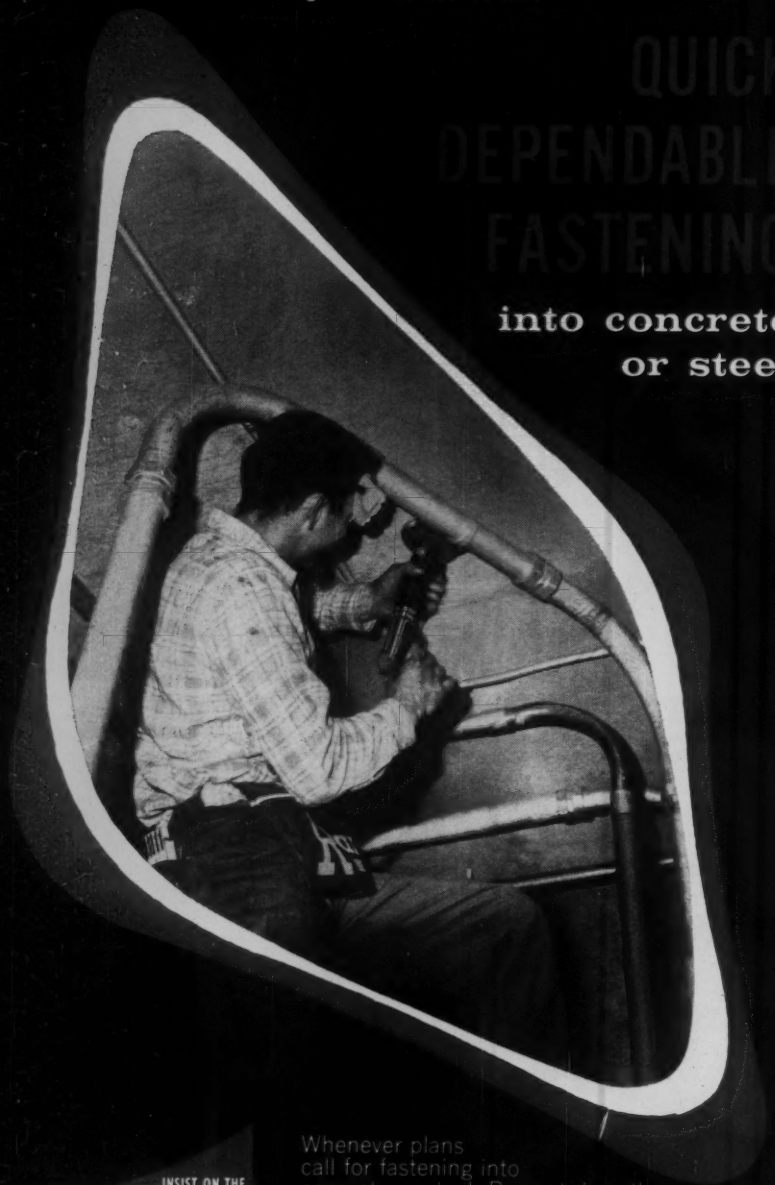
LINK-BELT SPEEDER

It's time to compare . . . with a Link-Belt Speeder

Leading contractors use Ramset for

QUICK DEPENDABLE FASTENING

into concrete or steel



Whenever plans call for fastening into concrete or steel, Ramset does the job in a split-second. Ramset powder-actuated fastening has proved far more efficient and economical than old-fashioned methods. With Ramset you're assured of quick, easy fastening, even under the toughest conditions . . . and every fastener is guaranteed!

Ramset offers an amazing variety of rugged Red Tip fasteners and dependable powder charges . . . just right for every application. This wide selection of fasteners and charges means you pay only for what you need . . . you get lowest in-place fastener cost with Ramset!

Call your Ramset dealer (under "Tools" in Yellow Pages) today, or write direct to find out how Ramset can save you money.

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Reader Comment

Highways Alone Won't Do

SIR—The editorial, "Is This Trip Necessary?" (ENR Jan. 21, p. 100), criticized among others, the Director of Transportation for the State of New York for his recommendation that tunnel tolls should be tripled as a means of reducing the traffic congestion on Manhattan. I do not necessarily agree with this method, as it is a negative approach to the problem. I most certainly disagree with suggestions relating to reduction of necessary expenditures for highway improvements as a means to an end.

However misguided these suggestions may be, they do indicate recognition of the fact that a program based primarily on highway improvements does not solve the problem, particularly with regard to the central business district. It may even intensify the problem for this latter area. Any solution for Manhattan or any other central business district must involve a reduction in the number of automobiles using the streets. Bypasses have eliminated unnecessary through traffic, but this is not enough.

There are other positive approaches to the problem than the ones quoted in the editorial. Take for instance the recent decision of the city of Philadelphia to subsidize commuter rail service as a means of reducing fares to a more attractive level. There is a need for giving more serious thought to promoting such suggestions for non-automobile transportation. It is a need which should not be passed off, particularly by a responsible periodical in the field concerned with matters of traffic and transportation, as a casual afterthought, as seems to be indicated by the statement ". . . providing the nation with adequate highways—and railroads too—for that matter . . ."

WALTER H. KONDO
The Hague, Holland

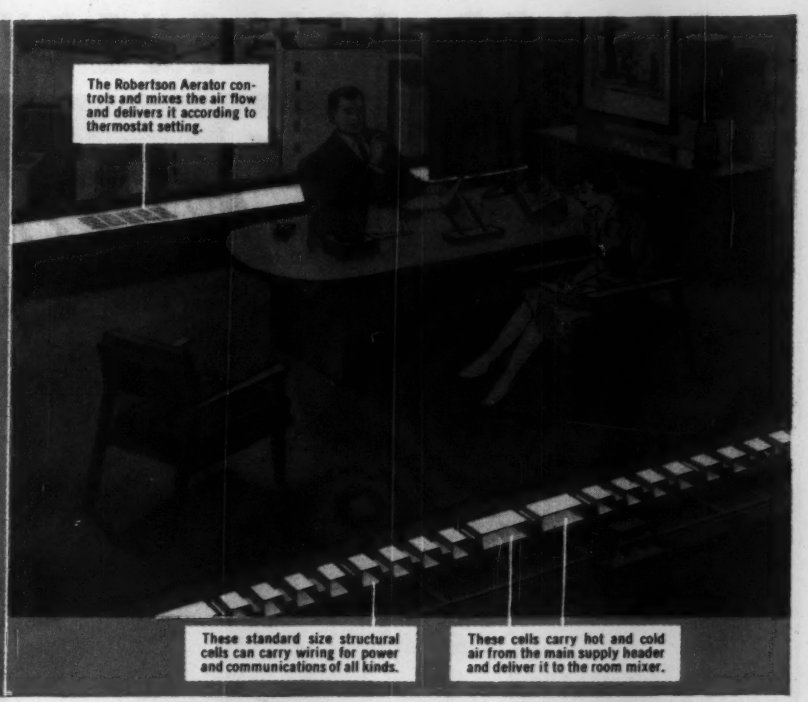
Contracts and Specs

SIR—Your editorial page in the Apr. 14 issue was most provocative and gratifying for me and the 9,000 members of the National Association of Plumbing Contractors. The subjects of both editorials are of urgent concern to us.

On "Owner's Choice," I was pleased to note your treatment of our recent booklet on separate contracts, because

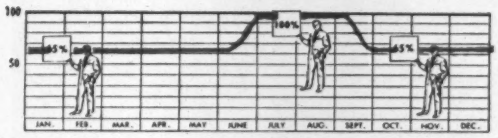
Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

Cut Capital And Annual Costs With


The Robertson Aerator controls and mixes the air flow and delivers it according to thermostat setting.
These standard size structural cells can carry wiring for power and communications of all kinds.
These cells carry hot and cold air from the main supply header and deliver it to the room mixer.

Robertson Q-Air Floor system

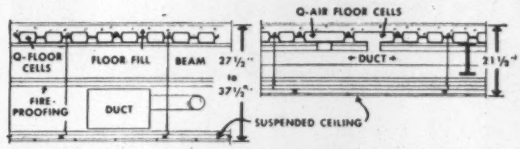
. . . increase air conditioning efficiency and save construction money



During the winter, Robertson Aerators satisfy heating requirements at 65% of peak volume.

For peak summer cooling, aerators deliver 100% volume and system runs at full power.

As cold weather approaches, changeover device adjusts system back to 65% of peak volume.



Simplified cross sections of ceiling-to-floor-above areas show old way left and Q-Air Floor right. Average compaction is one foot.

Basically, Q-Air Floor is an outgrowth of Robertson Q-Floor, the quarter-century-old cellular steel subflooring system which provides quick, efficient construction and continuous wiring raceways in more than 15,000 buildings. Within its own thickness, and without disturbing the 2-foot module of standard Q-Floor, the new system provides pairs of wide structural cells for use in connection with dual-duct, high-velocity air conditioning. These load-bearing cells are adapted by the air conditioning contractor to transport air from horizontal supply ducts to mixing units for discharge into the room.

The advantages of Q-Air Floor are threefold. The system includes the exclusive and patented Robertson Aerator, a mixing device with a seasonal changeover feature which keeps blower power at 65% of capacity except during peak summer load. Yearly power cost can be reduced as much as 30%. Since Q-Air Floor saves an average of a foot in depth per floor section, as much as 5% in building material cost can be saved—depending on the rise of the building. And this compaction inevitably results in up to an 11% reduction in overall BTU requirements.

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it constitutes the best exposition of the separate contract point of view that has ever appeared in your publication to my knowledge.

In AGC's latest plan for curbing bid shopping and bid peddling, however, universal use of the sigle contract system is *not* "tacitly assumed," as you state, but is insisted upon as a condition of compliance! This insistence in AGC's legislative and administrative efforts on the bid shop issue just doesn't seem fair to many contractors doing mechanical work. The general contractors should document their case for single contracts, if they can, before attempting to force it on anyone.

NAPC heartily endorses your "owner's choice" philosophy, feeling secure in the knowledge that, in the single contract system of construction, very often the owner gets "contractor's choice," which may be second best.

Regarding your second editorial, "What Price Loose Specs?" we wish to say Amen. It may be of interest that NAPC will issue in the next 60 days another brochure directed to architects and engineers. It will deal with a "By Others" specification and cover the need for accurate "rough-in" of equipment and piping. The delays we experience in obtaining such roughing-in dimensions hold up pouring of floors and building of partitions, and usually the mechanical contractor finally roughs-in what he believes to be right, so the job can proceed, only to find that changes have to be made. We naturally would like the equipment under our contract so we can determine the accurate dimensions promptly.

C. D. Brownell, Jr., Chairman
Technical Department
National Association of Plumbing Contractors
Champaign, Ill.

Baltimore, Yes, But . . .

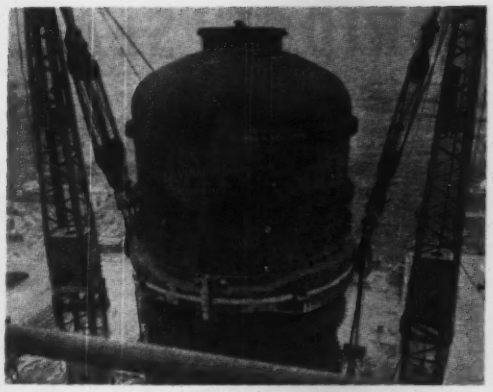
Sir—In you story titled "New Job for 1881 Water Tunnel" (ENR Mar. 17, p. 32), the reference to Baltimore City saving a million dollars is inaccurate. Although part of the work falls within the city limits and is under supervision of city authorities, the project is entirely financed by Baltimore County for Baltimore County water users and it is Baltimore County that is saving the million dollars, not Baltimore City.

Jerome B. Wolff
Assistant Director
Baltimore County Department of Public Works
Towson, Md.

Scrambled Aids

A story on federal aid for airports for fiscal 1961 (ENR Mar. 10, p. 24) reported that 40.9%, or $6,143,831, of the $58.8 million fund would go for runway construction. This amount should have been $24,078,141. The $6,143,831 will go for land.

A LIFT for ATOMIC POWER!



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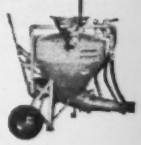

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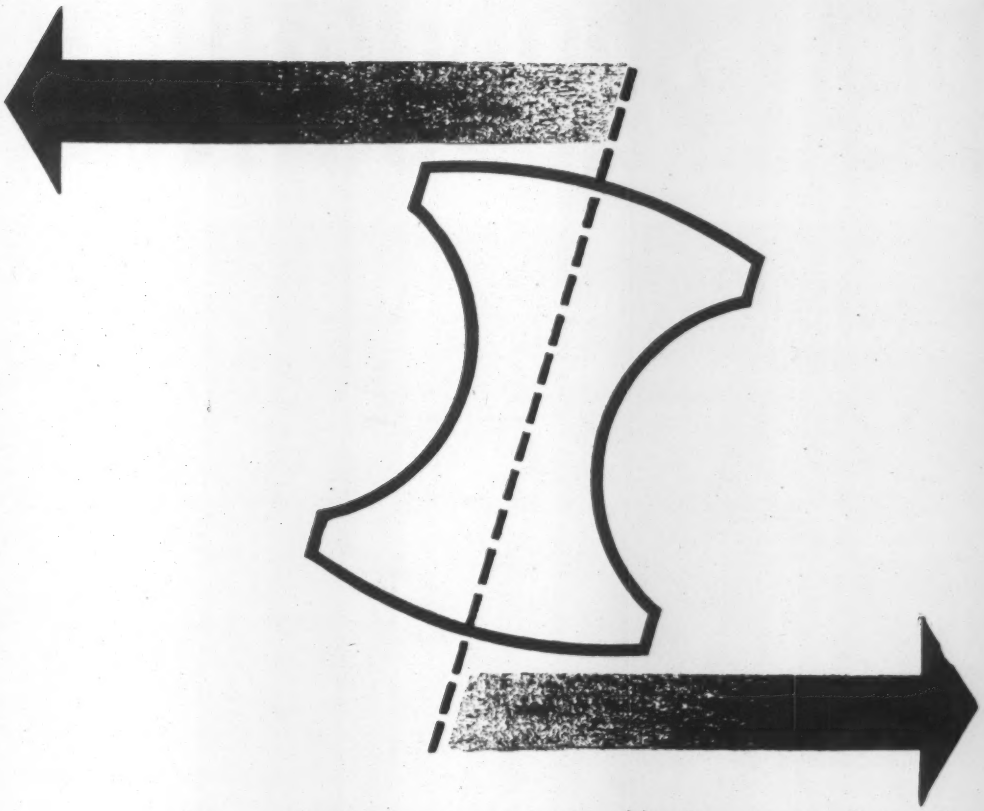

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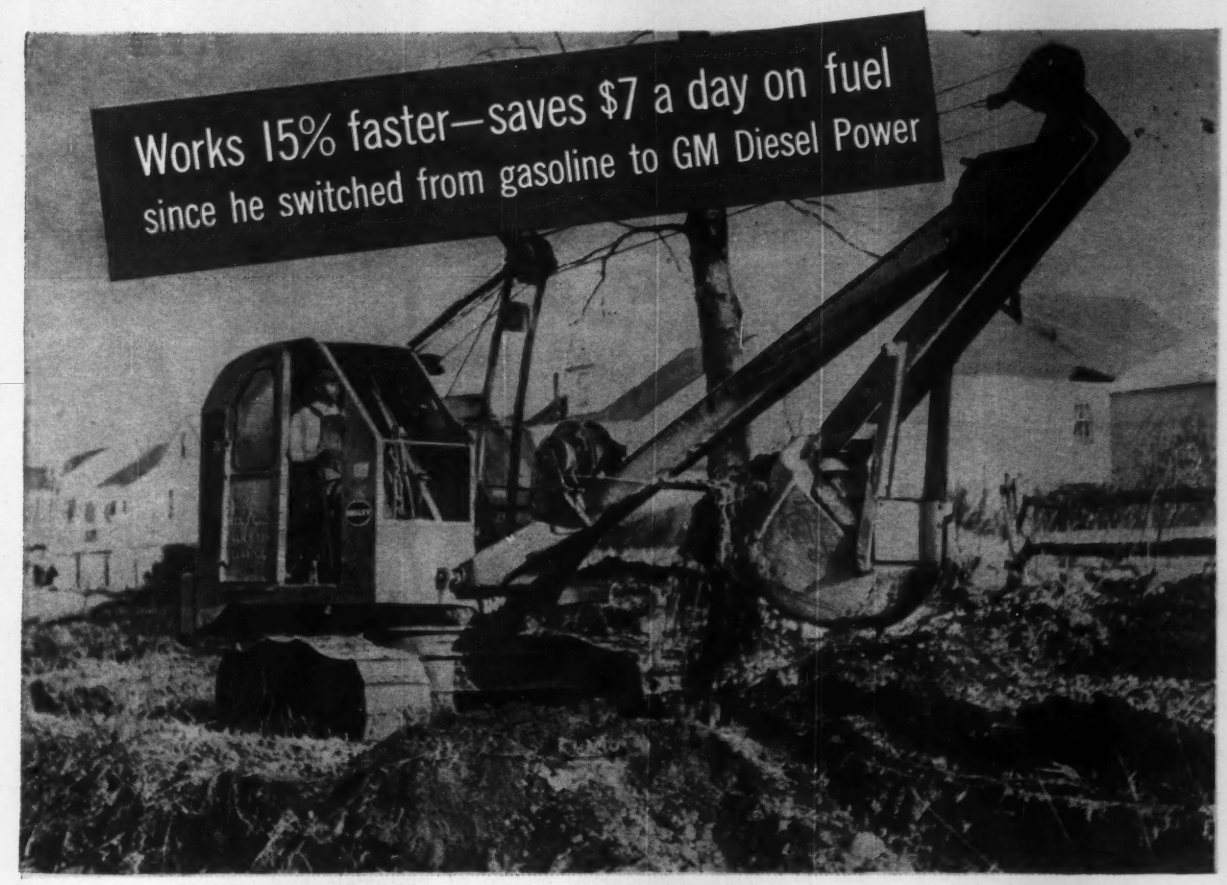

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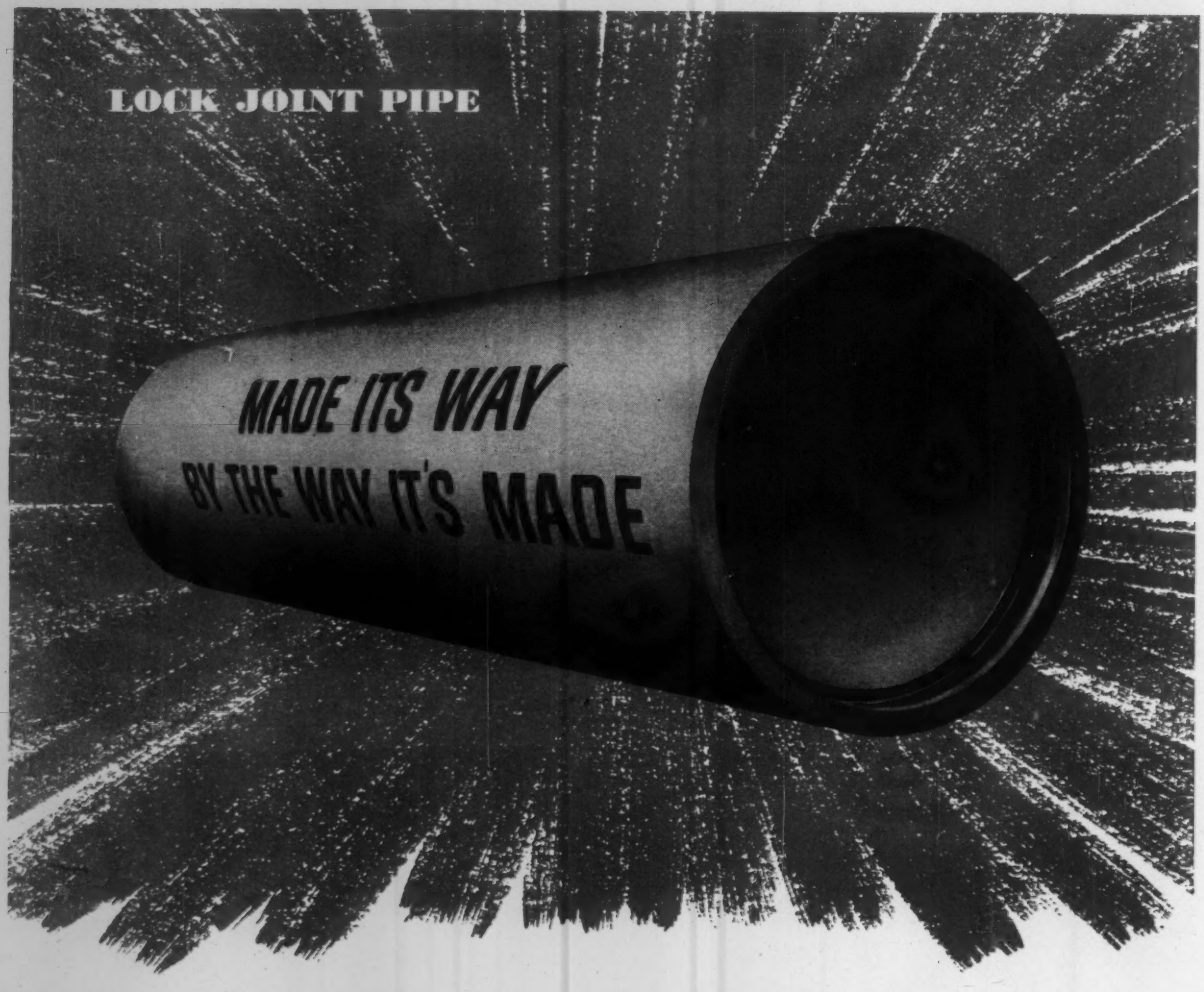

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ENGINEERING NEWS-RECORD

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THE CONSTRUCTION WEEK

WHAT NEXT?—Blatnik committee investigators have been digging in New York and New Jersey into the cost of right-of-way purchases and the use of consulting engineers on the Interstate. But odds are that unless they hit a vein of misdeeds at least as rich as that uncovered in Oklahoma, there will be no more hearings during this session of Congress. The committee knows it scored heavily in the first round (see editorial, p. 198); it doesn't want to produce a lesser show at this time. Right-of-way cost is also the subject of an investigation in Massachusetts by the Bureau of Public Roads. BPR is withholding payments to the state for land purchases pending a complete audit.

LOW BIDS GET LOWER—Better hone your estimating pencil one more time if a joint venture's apparent low bid on Chain of Rocks Dam on the Mississippi River is any barometer of the construction climate. The $2.9-million bid of Massman Construction Co. and Frazier Davis Construction Co. was only 61% of the Corps of Engineers' estimate for the rockfill control structure.

YOU CLOGGED IT, YOU CLEAN IT—Because they dumped solid industrial wastes there, three Chicago companies will have to pay for dredging the "obstructed" Calumet River Channel. So ruled the U. S. Supreme Court this week, putting aside a circuit court decision. Companies concerned are Republic Steel, International Harvester, and Interlake Iron.

RESTRAINED OPTIMISM—Equipment manufacturers still think this will be a record year, but they've lowered their sights. They predict an order volume barely 1% greater than last year's. This is 6% lower than their January forecasts for the year.

DESALTING ANTE UPPED—Senate Majority Leader Lyndon Johnson introduced a bill this week that would authorize $31.3 million for construction of brackish water conversion plants. The White House desalting program: $3.4 million.

HARDHAT HEAVEN—New York City has more than $7.7 billion worth of public and private construction either under way or on the drawing board. This includes $1.5 billion for public housing, $1.4 billion for Title I residential building, $1.3 billion for schools and colleges, $1.2 billion for major redevelopment, $1.1 billion for highways and bridges, $700 million for office buildings, $500 million for private homebuilding.

DOING IT FOR A SONG?—A $4,600 paving contract between Texas Butilithic Co. and Dallas sounds like it could have been written by Cole Porter. The contractor will pave Moonglow Drive and Old Ox Road from Red Bird Lane to Blue Moon Drive.

White concrete curbing increases highway safety

White concrete reflecting curbing, made with ATLAS WHITE portland cement, is a highly efficient safety-aid on highways, roads and streets. At night, the curbing gives the impression of being lighted, yet the effect is actually the reflection of headlight rays striking the corrugated surface. On rainy nights, the curbing becomes even more reflective. And during daylight hours, the whiteness of the concrete contrasts with the darker pavement, sharply outlining the road's edge.

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WASHINGTON OBSERVER

- Retirement plan for self-employed close
- VA opposes extending home loans
- IRS interprets Peurifoy decision

● **Chances of Congress voting legislation for self-employed retirement plans are improving.** The Senate Finance Committee is ready to take to the Senate a bill similar to the Simpson-Keogh bill, already passed by the House. That bill permits self-employed engineers, self-employed contractors and other professionals to take tax deductions up to $2,500 a year and apply the money to an approved retirement plan.

The Treasury Department opposes the simple language of the Simpson-Keogh bill. It wants amendments requiring the self-employed manager also to provide substantially for retirement of any employees.

But the Senate committee has about decided to put off the consideration of the Treasury language until later.

—

● **The Administration is trying to block extension of Veterans Administration housing aid.** The Senate Banking and Currency subcommittee on housing is considering legislation to extend housing loans to World War II and Korean veterans from July 25, 1960 to Feb. 1, 1965. But P. N. Brownstein, director of the VA loan guaranty program, says an extension is not needed. The President opposed extension in his fiscal 1961 budget.

The outlook for the extension is about 50-50 in Congress. Should it pass, a veto is possible.

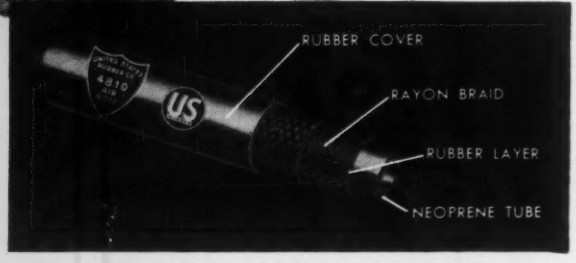
—

● **At long last, the Internal Revenue Service has handed down a ruling on deductibility of construction workers' traveling expenses.** It's the first IRS interpretation of the situation since the Supreme Court handed down its famous Peurifoy decision back in November 1958.

The new ruling is unusually detailed in an attempt to make it easier for a worker—and his employer—to judge whether the expense is (1) reasonable and necessary, (2) incurred "while away from home" and (3) "incurred in pursuit of business," and therefore deductible. Two examples of disputed cases are analyzed in relation to the court rulings, which turn, generally, on deciding whether a worker is "away from home."

Employers get involved because of the recent Treasury requirement that they withhold federal income taxes on living or travel payments that legally don't meet IRS tests and therefore are taxed as income.

Copies of the ruling (60-189) are available free from the Public Information Division, Internal Revenue Service, Washington 25, D. C.



Where men and hose flex their muscles

Here's the hose that's as rugged as the men who use it. On the really tough construction jobs—where tight quarters, abrasive terrain and high working pressures take their toll of ordinary air hose—mandrel-made, wrapped-finish, U.S. 4810 Air Hose stands up to use *and abuse.*

Yet, despite its great strength, 4810 is no muscle-bound hose. "U.S." engineering has made it easier to handle, readily flexible, able to take higher working pressures—*and less expensive*—than the conventional air hose you might be using. It's one of a complete line of U.S. Rubber construction hose.

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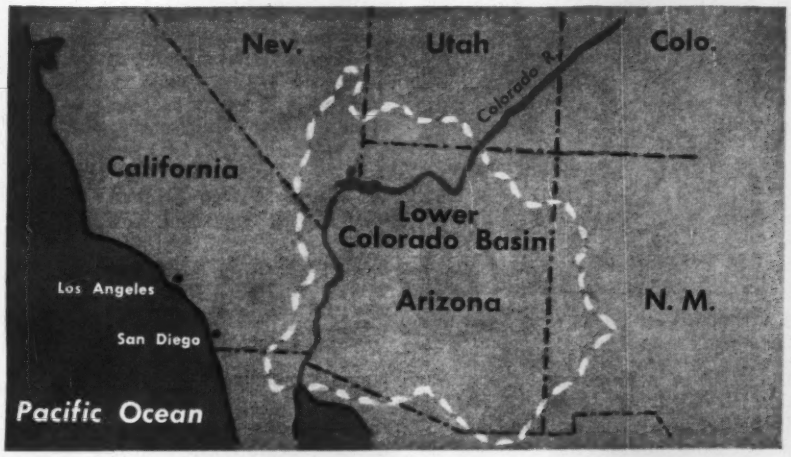


Lower Colorado Basin dispute moves toward settlement.

Where mainstream water goes.

A New Course for the Colorado

By James B. Sullivan

Jubilation in Arizona, hurt disbelief in California—that was the reaction last week to the tentative recommendations on lower Colorado River water rights made for the U. S. Supreme Court by Special Master Simon H. Rifkind.

If further pleas fail to change the report and it is backed up by a final ruling from the Supreme Court, Arizona will get the right to another million acre-ft of Colorado River water that California has already spent millions of dollars to collect and transmit.

The report follows more than two years of hearings by the special master in a suit filed in 1952 by Arizona against the State of California and seven California municipalities and agencies. Also brought in as parties to the suit are the U. S. government, Nevada, Utah and New Mexico, the latter two because of interest in Colorado River tributaries.

None of the disputed amount is actually in use now. However, California expects to be using most of the million acre-ft in the Los Angeles-San Diego region by 1975. And Arizona has had extensive irrigation plans on the shelf

*ENR's **Jim Sullivan** spent last week digesting the master's report and reading thousands of words of copy filed by ENR's Washington staff and southwestern correspondents (organized for this fact-finding job by West Coast Editor Larry Wise). Result: This report on what the Colorado River case means to construction.*

CENTRAL ARIZONA PLAN could mean $1.5 billion in construction. One of three alternate diversions would take Colorado water to Granite Reef Dam, from there irrigation distribution system would radiate. Plan 1 would require high dam at Bridge Canyon to furnish pumping power. 2 and 3 would entail low dams.

for a long time, awaiting both water and money.

• **Where the water goes now**—The big issue is mainstream consumptive use (diversions less return flow). In the case of Arizona, only the diversions could be determined. They totaled something over 1.2 million acre-ft a year in the mid-1950s. California's consumptive use totaled 4.5 million acre-ft and Nevada's, 24,450 acre-ft.

Growers are the big consumers. California's rich Imperial and Coachella valleys alone tap the All American Canal for more than 3.6 million acre-ft a year (consumptive use).

Estimates by witnesses placed California's future needs from the Colorado at well over 6 million acre-ft a year. Rights considered valid by the state total 5,632,000 acre-ft a year. But the Arizona suit asked the court to limit California use to 4.4 million acre-ft.

• **The Rifkind allocations**—Under the Rifkind recommendations, the first 7.5 million acre-ft made available by the Interior Department would be divided this way: 4.4 million acre-ft to California, 2.8 million acre-ft to Arizona and 300,000 acre-ft to Nevada. These relative proportions would apply if less than 7.5 million acre-ft were available. California and Arizona would divide equally any surplus above 7.5 million acre-ft (with the condition that the U. S. could satisfy possible contractual obligations to Nevada with 4% of the surplus, deducted from Arizona's half).

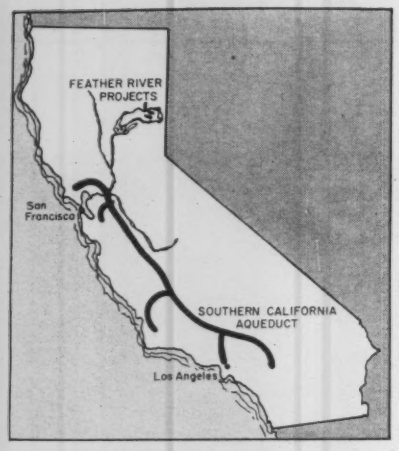
Recommended priorities according to use would be: first, river regulation and navigation; second, irrigation and domestic use; third, power. Mexican treaty releases would be made without regard to the three use priorities.

Arizona's right to 1 million acre-ft of Gila River water is confirmed as separate from the 2.8 million acre-ft of mainstream water.

• **Central Arizona Project**—The big possibility opened up for Arizona is an ambitious irrigation plan that has lain dormant since Congress declined backing for it in 1949. Known as the Central Arizona Project, the scheme would have cost about $740 million to construct in the late 1940s and would cost nearly $1.5 billion now.

Prospects for the development are far from clear and even the plan itself is a long way from being perfected. Three alternate schemes are likely to be considered, all diverting water from the Colorado mainstream to an existing diversion barrier. Granite Reef Dam northeast of Phoenix. From there it would be distributed to points as far south as Tucson.

Under Plan 1 (see map on p. 25), water would be diverted from Havasu Lake (behind Parker Dam) into Granite Reef Aqueduct. It would pass through mountainous terrain for the first 25 miles, then skirt ridges and traverse desert land for the remainder of its 241-mile length. Pumping power would be generated by a proposed high dam at Bridge Canyon.



FEATHER RIVER PLAN gets a boost from California's Colorado setback.

Under Plan 2, water would be diverted from behind a low Bridge Canyon Dam to Granite Reef Dam via proposed 77-mile Big Sandy Tunnel and 250-mile-long McDowell Aqueduct. The aqueduct would consist of 226 miles of canal, 14 miles of tunnel and eight miles of siphon. Power would be generated at the tunnel outlet.

Under Plan 3, water would be diverted from Bridge Canyon Reservoir (again a low dam) via a canal and wash, emptying into Chino Creek and thence into the Verde River, which runs down to Granite Reef Dam.

Financing is undetermined, though sentiment within Arizona is for the do-it-yourself system with revenue bonds—not federal aid.

• **Who gets hurt in California?**—The big loser under the Rifkind formula will be southern California's Metropolitan Water District. This utility serves a sprawling five-county area including both Los Angeles and San Diego and expects by 1975 to be supplying 87 municipalities having a population of 10 million.

MWD's priority on the total water allotted to California is way down the list. Four irrigation areas along the Colorado—including the Imperial and Coachella Valley districts and Palo Verde—have first call on a combined total of 3,850,000 acre-ft a year under the priorities system set up in California in connection with the Colorado Compact of 1922. MWD follows with a priority on 550,000 acre-ft.

Next under the existing intra-California priorities system is another 662,000 acre-ft for the MWD. This is the critical priority because those preceding it add up to 4.4 million acre-ft, the basic total recommended for California under the Rifkind formula.

It is entirely possible that a scrap could develop within California for the state's allocation. Although priority of the river-bank irrigation areas is established in both federal and state law, another California law gives municipal demands precedence over those of agriculture. This is a matter for the courts to settle, says Harvey O. Banks, California's Director of Water Resources.

• **What can California do?**—California officials say they are going to fight the adverse formula both before the special master, in the remaining few weeks he has allowed, and later before the Supreme Court itself, when it considers the special master's recommendations. Physical measures to make up the expected future deficit could consist mainly of groundwater recharge with Colorado River water while it is still available, and the controversial multi-billion-dollar plan to divert water from northern California streams to the arid south.

• **Governor to lead fight**—Gov. Edmund G. Brown led the anguished outcry in California over the special master's report. "We shall certainly reassert our rights before the special master and if necessary the United States Supreme Court," he declared.

Rarely does the Supreme Court upset a special master's recommendation. A special master—usually a retired judge or experienced lawyer—is appointed only in complicated cases involving extensive fact-finding in addition to legal judgment. But upsets do occur.

Just what further arguments California expects to pursue were outlined by Northcut Ely, a Washington lawyer who has represented California in water matters for many years. He said the counterattack will probably be based on two main points: (1) Rifkind's decision that the Colorado River Compact of 1922, under which the southwestern states first divided the water, is irrelevant; and (2) Rifkind's action in sweeping aside the law of prior appropriation and substituting a prorationing system among California, Arizona and Nevada.

Disappointment at the special master's report was also voiced publicly by the Metropolitan Water District's board of directors: "California bases its right to its full contract share of Colorado River water not upon a claim of impending famine and devastation but upon a record of its fair contract rights [under Interior Department contracts with individual agencies] and its invest-

ment, in good faith, of $500 million in the construction of the works required to carry out these contracts . . ."

The general chagrin was echoed also by the Colorado River Board, a state agency organized to defend California's water rights: "My reaction was one of bitter disappointment," declared board chairman Fred Simpson. "The special master has thrown into the can the historical understanding of 'first come, first served.'" Mr. Simpson said he was "crushed that Rifkind would give Arizona and the U.S. government everything they requested and California much less than we need."

• **The groundwater recharge plan**—Ironically, the Rifkind report was released almost simultaneously with ceremonies marking completion of the main line of MWD's 242-mile Colorado River Aqueduct (ENR May 12, p. 27). The newly completed phase of the 30-odd-year-old line was a $200-million expansion begun in 1952 to bring it up to the full design capacity of 1,212,000 acre-ft a year. This is the total of MWD's two priorities.

The expansion might appear at first look to be a waste of money and time, and it undoubtedly never would have been undertaken if a decision such as the one now foreshadowed by the Rifkind report had been deemed likely. Prior to release of the report, the aqueduct had not been expected to flow at full capacity until 1975. However, the added capacity may now be put to work for all it is worth while Colorado water is still available.

"There must be an immediate and extensive program of replenishing underground water basins in southern California," the MWD directors have declared. "We are dedicating a full-capacity aqueduct ready and able to deliver this replenishment water. Accordingly, it is hereby recommended that the next legislature be requested to appropriate between $20 million and $30 million to help meet the cost of launching a major water replenishment program to be carried forward during the next 10 to 15 years while the people in the MWD service areas are approaching their day by day use of a full aqueduct flow."

• **California's alternative**—Although a stunning blow to California, the Rifkind report actually comes as a boost to the state's controversial $1.75-billion water-bond proposal.

Scheduled to be submitted to the state's voters in November, the proposed bond sale would provide money to finance a major part of a water collection, storage and transfer scheme of unprecedented proportions. River flows now unused in the northern part of the state would be tapped and channeled southward through an impressive system of canals, tunnels and pipelines. Among the principal recipients of the water would be users in the service areas of the Metropolitan Water District. The plan has been under strong attack.

Strength of the opposition has made defeat of the proposal appear likely, but the Rifkind report is rallying support for the measure. Governor Brown and Los Angeles Mayor Morris Poulson have both issued statements emphasizing the importance of a favorable vote.

"Failure to pass the water bond issue in November," Governor Brown said, "combined with curtailment of water supplies from the Colorado River, would have disastrous consequences for the economy of not only southern California but the entire state. California's need for more water just as quickly as possible is now imperative."

• **California still has time**—The limitations won't take effect this year or next, even assuming the Supreme Court sticks to Judge Rifkind's recommendations. But California officials will be forced to think and act more decisively and cohesively than they have in the past.

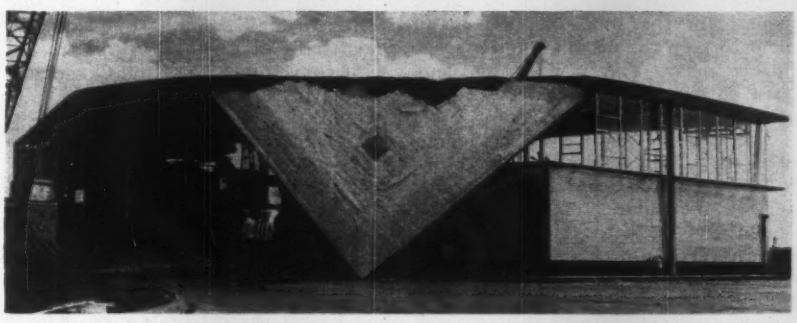
Arizona's plans for more Colorado River water have been gathering dust for 10 years. It will take that many more, if not an even greater number, to plan, finance and get started on the works necessary to use the water.

The prospect of delay is ammunition for opponents of the proposed bond issue. MWD, a powerful holdout so far, evidently intends to remain so. The directors issued a statement declaring: "Dire consequences have been forecast for many areas within the district. These forecasts of disaster are without foundation in fact. . . . They serve to incite a degree of panic that is unjustified and acutely harmful to all southern California."

There will be no adverse effect now or for many years to come, MWD maintains. It would be at least 12 to 15 years and possibly as long as two generations before contemplated projects would reach the point of reducing the water available to the Colorado River Aqueduct, declares MWD.

The influential San Francisco Chronicle also pooh-poohed some of the reaction to the Rifkind report. It has drawn "some uncommonly preposterous comment," the Chronicle editorialized, "not the least of which is that of Governor Brown."

HP Snaps, Crackles and Pops . . .



. . . Then Collapses on Gas Station

Half of a five-month-old hyperbolic-paraboloid roof crashed down on a Dallas service station last week. No one was injured—attendants were warned by the "pinging, cracking and popping" just before the first quarter of the reinforced concrete structure went. Another quarter followed half an hour later.

No one concerned would venture a guess on what caused the failure.

Windsor Properties, Inc., owns the station, which cost nearly $90,000 to build.

Although completion date for Gorge High Dam is past . . .

M-C&S Won't Be Penalized

Merritt-Chapman & Scott's hard-pressed construction department (ENR May 5, p. 23) is breathing a little easier this week because Seattle has taken the squeeze off the behind-schedule Gorge High Dam on the Skagit River.

The city has agreed to continue monthly progress payments to the contractor on estimates through this year. But, lest M-C&S breathe too easily, Seattle retains its rights to liquidated damages, which began accumulating April 6, when the extended time for completion of the dam was passed.

The project cannot be completed before next April, according to an estimate by Seattle City Light Superintendent Paul R. Raver. By then the city will be holding about $2 million in retained percentage funds.

Seattle went along with M-C&S's request for the supplementary agreement to keep the overdue project from further delay. The new arrangement must be approved by the City Council and the Board of Public Works.

The project was delayed by failure of an ice curtain designed by the owner to serve as a cofferdam. The contractor declares the failure was due to faulty design and went to court to recover damages. The contractor's suit was dismissed in Federal District Court, but the decision has been appealed to the Circuit Court of Appeals in San Francisco.

Meanwhile, as of May 1, the contractor had completed placement of 230,000 cu yd of the total 272,000 cu yd of concrete to be placed in the dam. Construction has reached within 48 ft of the top of the 300-ft-high dam. The spillway section, which already has reached its maximum height, will be surmounted by two spillway gates, each 50½x47 ft.

City Light's Gorge Powerhouse, just below the dam, will be shut down from mid-May to July 1 while the original intake tunnel is shut off and provision made to use the new intake. During that period, water that normally flows through the power tunnel to operate the Gorge generators will be let out through an 8-ft-dia temporary diversion outlet in the arch section of the dam and through two permanent outlets, each 8¾ ft square, in the gravity portion of the dam. These openings will handle water flows up to 5,000 cfs. One section of the dam is being left open at a low level to permit passage of water in excess of that amount.

During the shutdown period, the contractor will continue to place concrete and City Light crews will proceed with converting one of the Gorge generators to high-head operation. Water behind the new dam will be 88 ft higher than behind the present low-head dam. Two of the generators already have been converted and the fourth will be changed over in the summer of 1961.

The additional head provided by the new dam and modernization of the powerhouse is expected to increase capacity of the Gorge plant by 57,000 kw, from 108,000 to 165,000 kw. This winter, with one generator yet to be converted, the plant capability is expected to be about 160,000 kw.

The dam is approximately 670 ft long, with the gravity section 170 ft thick at the base. An arched portion is about 70 ft thick at the base. It will be 16 ft wide at the crest.

Congress

A gradual pickup in housing detected in the past few months is coloring the politicking on this year's housing legislation in Congress.

The Census Bureau last week released its latest report on housing. It shows a 10,000 pickup in seasonally adjusted starts for both March and April. The rate for March was 1,125,000; for April, 1,135,000.

Administration officials are quick to point to the Census report as proof to back up their claims that easier money is providing the stimulus needed for a pickup in housing and that increased federal actions are unnecessary.

Democrats are turning a deaf ear to these pleas, however, as they prepare to push two back-to-back housing bills through Congress. President Eisenhower is primed to veto both as they now stand.

Democrats argue that federal action is called for because housing starts so far this year are running far behind the pace of last year: A combined rate of 1,147,000 for the first four months of this year compared with 1.4 million for the same period in 1959.

One measure, sponsored by Rep. Albert Rains (D., Ala.), already has been passed by the House. This bill would give Federal National Mortgage Association (Fannie Mae) emergency authority to buy an additional $1 billion in low-priced mortgages.

Without even waiting for the Senate to complete action on this legislation, Rep. Rains last week introduced a second bill—the traditional omnibus measure Congress passes each year.

This legislation would provide, among other things, a new program to have the Federal Housing Administration insure loans to builders and developers who run into troubles securing financing for developments of subdivisions. Also proposed is a new system for purchase of conventional mortgages to be carried out by the Home Loan Bank Board.

The measure also would expand FHA's lending insurance program and grant Fannie Mae more authority and buy mortgages insured by FHA and the Veterans Administration.

And Mr. Rains says his housing subcommittee may decide to add features for public housing and housing for the elderly and colleges. This would go beyond provisions of a general omnibus bill recommended in the Senate by Joseph S. Clark (D., Pa.).

Congress earlier passed a bill designed to give an extra fillip to the mortgage money market.

The measure, long favored by the construction industry, would provide a

Moves Housing Bills Nearer Ike's Veto

tax break to banks, savings and loan associations, insurance companies and other institutions selling mortgages to Fannie Mae by allowing the institutions to claim an immediate income tax deduction on the loss incurred in buying, and later selling, Fannie Mae stock.

To sell mortgages to Fannie Mae, institutions must now purchase stock of the agency in the amount of 2% of the face value of the mortgages sold.

Fannie Mae sells its stock at par—$100 a share. In relation to that price, the divided yield to the buyer currently is only 2.76%. And on the over-the-counter market, the stock now sells for about $52 to $54 a share. In recent years it has ranged from a low of $40 to a high of $64.

The bill would allow banks and other institutions to take an immediate tax deduction on the difference between the going market rate and the price paid Fannie Mae for the stock.

In addition, the institutions would have to pay only a capital gains tax in event that the stock went up later and was disposed of at a higher price.

For example, say a bank sold a $5,000 mortgage to Fannie Mae. The bank would have to buy $100 in stock. At a market price of $52, the bank would be able to claim a loss of $48. If the price of the stock were to rise later by say $8 to $60 a share and were then sold, the bank would have to pay a capital gains tax of 25% of the profit, or $2, on the $8 increase in the value of the stock.

The loss taken would be $46—the original declared loss of $48, less the $2 capital gains tax. Under existing law, the bank would claim a loss of only $40—the difference between the cost of the stock, $100, and the actual sale price of $60.

Itschner's Tour With Corps Is Extended Two Years

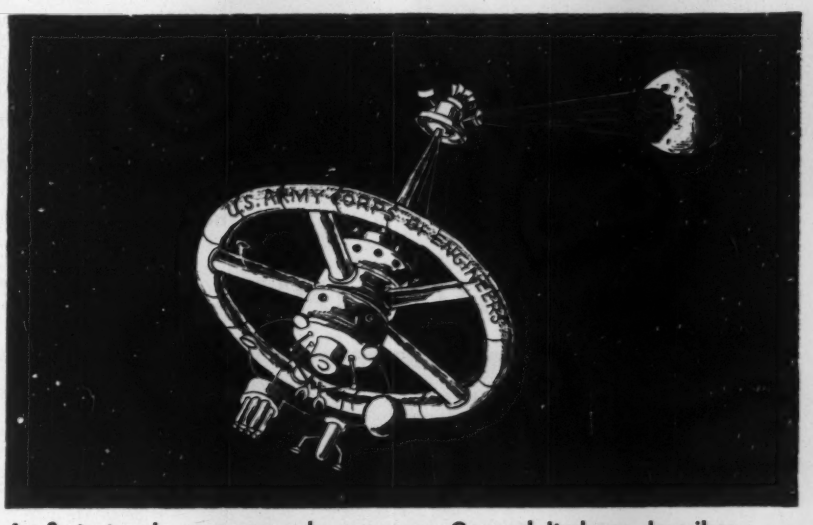
Lt. Gen. Emerson C. Itschner, who was appointed chief of the Army Corps of Engineers in October 1956, has been given an unprecedented two-year extension of his tour by President Eisenhower.

The 57-year-old general was one of the youngest men ever to command the Corps when he was appointed four years ago. He supervises some $2 billion worth of construction work, military and civilian, in the U. S. and abroad.

The extension was recommended by the Secretary of Defense, the Secretary of the Army, and the Joint Chiefs of Staff—"the first time anyone can recall all these people agreeing on anything," said one Itschner aide. No reason was given for not selecting another officer to succeed General Itschner in the post of Chief of Engineers.

General Itschner graduated from West Point in 1924, and won his civil engineering degree from Cornell in 1926.

Lt. Gen. Emerson C. Itschner



As first step in a moonworks program, General Itschner describes . . .

Plans for Mapping the Moon

The Corps of Engineers is ready, willing and able to start plowing up the surface of the Moon—if only it had a decent map of the place.

An up-to-date map of the jobsite is the crucial first step of any self-respecting moonworks program, Lt. Gen. Emerson C. Itschner last week told the star-gazing House Aeronautics and Space Committee.

But moonmapping would cost about $8 million of funds that would have to come from the National Aeronautics and Space Agency, which up to now has not been moonstruck over the project.

Nevertheless, General Itschner brought along for the committee's information a complete timetable and cost estimate for mapping the face of the Moon.

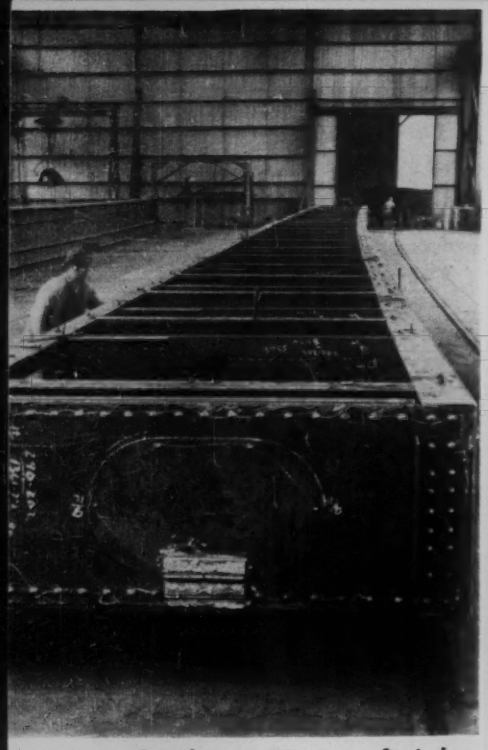
By 1963 and for $3 million, the Corps could gather all available photos of the jobsite, take and recover new ones from high-flying balloons and design the necessary instruments for a close-in, satellite-borne view.

For another $5 million, the instruments could be built and tested, with the picture-taking excursion scheduled for 1965.

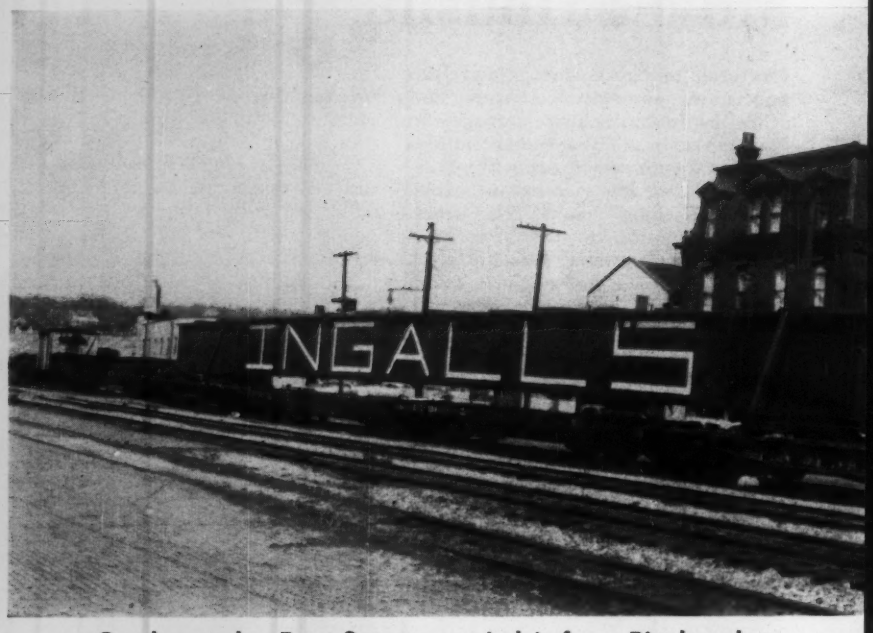
There are now three possible ways of mapping the Moon from a satellite, General Itschner said: by TV camera transmitting back to Earth; by camera, with the film returned to Earth and recovered; and by radar.

General Itschner urged the committee's support for its plan. The Corps' goal, he said, is construction of an observation base on the surface of the Moon within 10 years.

"We believe a research and development effort to develop the capability for space construction should be undertaken soon if man is to have the capability of existing on the Moon," General Itschner said. "We stand ready . . . to serve the nation in this age of space."

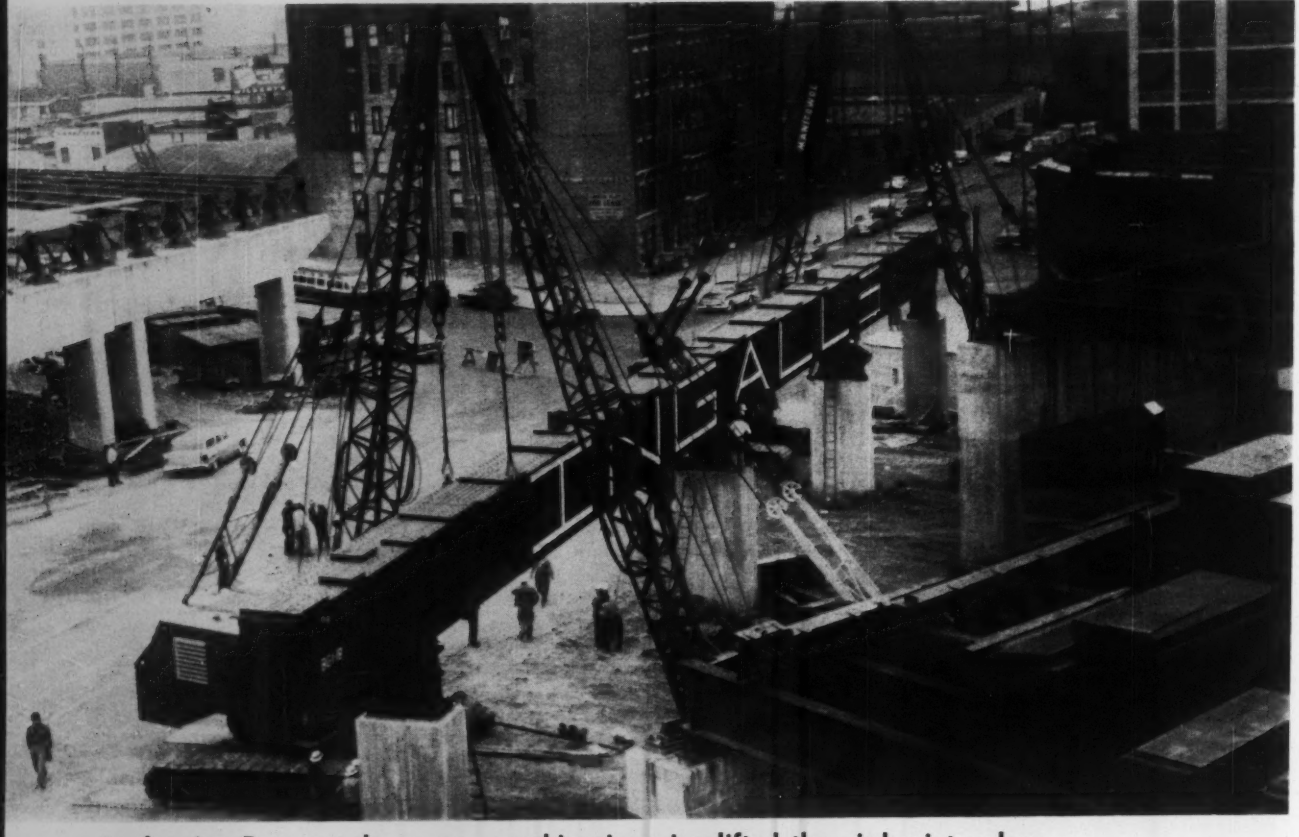


In the shop: 132 tons of girder.

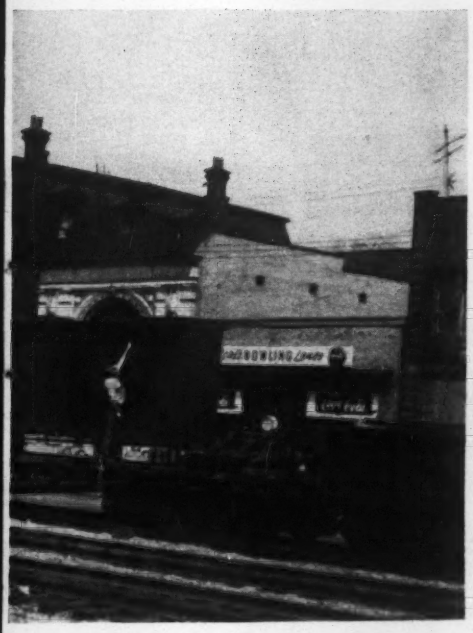


On the tracks: Four flatcars carried it from Pittsburgh to

Long Haul for a 176-Ft-Long Box



At the site: Four crawler cranes, working in pairs, lifted the girder into place.



New York City.

Girder

At the point in the Bronx, N. Y., where Willis Ave., the Major Deegan Expressway, a Triborough Bridge approach and the Bruckner Expressway all fuse together in an elevated roadway complex, there's a single box girder more than 176 ft long and weighing 132 tons.

Moving the mammoth girder to the site from the yards of Ingalls Iron Works Co. near Fittsburgh posed a mammoth transport problem.

The girder rode the rails to a siding in the Bronx on four flatcars. The trip was 190 miles longer than usual because of two necessary detours, one into northern Pennsylvania, the other to cross New York Bay on a car ferry.

A railroad wrecking crane at the Bronx siding deposited the girder onto two flatbed trucks.

Then came the tough part of the trip—hauling the long, cumbersome load through the Bronx streets in the grey hours of a Sunday dawn.

The lead truck operated like a double bottom rig—tractor, semi and trailer—but the tail truck had to face backwards, grinding all the way to the site in reverse. At the site, four crawler cranes lifted the cambered girder onto bearings on the highway piers.

Moving costs: about $4,400.

The trucking trick was handled by Bigley Bros., Inc., of North Bergen, N. J. Owen J. McGarrahan Co., Cambridge, Mass., erected the girder.

Scandal Effects Worry Users...

Delegates to the Eighth Biennial Highway Transportation Congress in Washington last week viewed with alarm recent developments in the federal-aid highway program and voiced concern over financing of future construction. Sponsored by the National Highway Users Conference, the meeting was attended by 2,000 persons.

The Oklahoma road scandal (ENR May 12, p. 21) raised questions of whether the federal government would move in with stricter controls.

Federal Highway Administrator Bertram D. Tallamy told the group that tighter controls already have been imposed by the Bureau of Public Roads in the wake of the Oklahoma hearings. To prevent laxity and wrongdoing "in a very few places," he has ordered "surprise" checks of federal-aid highway projects by BPR inspectors.

But Mr. Tallamy rejected suggestions that the federal government take a more dominant role in roadbuilding.

Any move toward more federal control was decried by Daniel H. Stevens, President of the American Association of State Highway Officials and Maine Highway Commissioner. However, he urged more authority for BPR to prevent abuses.

Rep. John A. Blatnik (D., Minn.) criticized the "pay-as-you-go" policy of financing highways and said the overhauling of highway legislation is a "must" for the next session of Congress.

"Instead of pay-as-you-go, we have a stop-and-go, hand-to-mouth penny-pinching, penny-wise-and-pound foolish existence," Representative Blatnik said.

William S. Richardson, Director of B. F. Goodrich Co. and new chairman of the National Highway Users Conference, called for removing the highway program from jurisdiction of the Department of Commerce and establishment of a seperate National Highway Board.

Roger Fleming, secretary-treasurer of the American Farm Bureau Federation, and Frederick Hufnagel of Sun Oil Co. warned against any acceleration of the present program. Mr. Hufnagel says a speed-up would "result in considerably more waste and higher cost."

Delegates also were concerned about the effect of the new compact cars with their reduced gas consumption (ENR Feb. 11, p. 87).

They heard estimates that gas tax revenues would be $548 million below current estimates by 1964 if the trend to economy cars continues at the present rate.

Other delegates said the best way to keep the road program fiscally sound was to halt the diversion of highway-user taxes.

...AASHO Maps Wider Controls

The Oklahoma road construction scandal (ENR May 12, p. 21) has prodded the American Association of State Highway Officials to take steps against recurrence of the irregularities turned up by Congress in the building of the Skelly Bypass in Tulsa. Final details were worked out last week at the Washington meeting of the Highway Transportation Congress.

AASHO officials have agreed to draw up guidelines for testing, placing of materials, proper documentation and general engineering administration of construction projects.

Such a step marks a sharp departure from AASHO's traditional policy of drawing up and recommending standards and specifications solely for technical aspects of roadbuilding.

The association's new policy will take it into the field of proper administration of roadbuilding projects from the time of contract award through completion of construction.

The new study will be conducted by a 10-man group composed of AASHO president David H. Stevens, D. E. Bray, AASHO vice president and two state highway officials from each of the four AASHO regions.

Mr. Stevens emphasizes that the group's recommendations will be for use as general guidelines; they will not be binding on the members of the association, all of whom are heads of their state highway departments.

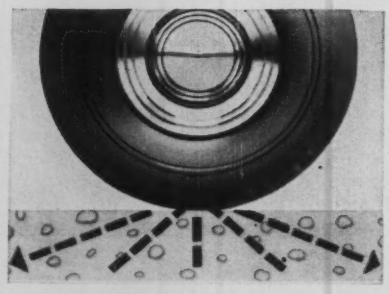
State highway officials feel that the primary responsibility in avoiding further scandals rests with the states. Back of the move by AASHO is real concern that unless the states act, the federal government will step in with tighter controls and closer supervision of state highway activities.

The AASHO committee hopes its recommendations will be ready for approval by the members within the next four or five months. One key recommendation under consideration is for some form of double-checking of inspection tests on materials used in construction. The idea is for a central testing laboratory to send out its own inspectors to spot check results made by inspectors on the jobsite.

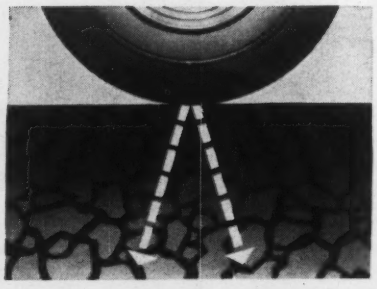
FOR HIGHWAYS WITH A SOLID FUTURE

Concrete

CONCRETE is the ...gives maximum strength



Concrete's beam effect spreads wheel weight over large area of subgrade, reduces spot pressures. Strength of material—not mass—carries the load, permitting minimum-thickness pavement.



Flexible pavement, by its very flexing effect, transmits load forces in almost direct line to subgrade. Excessive concentration of load force can be overcome only by building up pavement thickness.

Modern concrete for Kentucky's Interstate 65 south of Elizabethtown

pavement that is not flexible with minimum thickness!

Interstate System highways like Kentucky's Route 65, pictured here, call for a pavement that is solid and unyielding.

Kentucky's highway department chose concrete for this important stretch of Interstate System highway. Necessity for multiple strata construction of 2 to 3 times greater total depth was avoided.

Strength with minimum bulk is possible, of course, because concrete isn't flexible. It supports and spreads the load like a beam. Pressures on the subgrade stay permanently within safe limits.

And concrete's design efficiency assures low maintenance costs in years ahead. In fact, maintenance costs will be as much as 60% lower than for asphalt. Only concrete enables engineers to design highways to last 50 years and more.

You can see why engineers and taxpayers agree that concrete is the preferred pavement for heavy-duty highways—especially on the new Interstate System.

PORTLAND CEMENT ASSOCIATION *A national organization to improve and extend the uses of concrete*

Around the World . . .

• **Wet warehouse**—Engineers have picked a site near Florida for a new warehouse. It's underwater in the Gulf of Mexico. Firestone Tire & Rubber Co., Jet Fuel & Storage Co., and Global Marine Exploration Co., will fill outsized containers of rubber impregnated fabric with gasoline, oil, grain or whatever you want kept out of the way and lower them to cradles 40 to 200 ft below the surface.

• **Dry days ahead**—It looks like a dry year for all three West Coast states, according to the Soil Conservation Service of the Department of Agriculture. A spring check of snow depth and water content in the western mountains coupled with water level reports on some 250 reservoirs indicate below-average water supplies for Oregon, Washington and California.

• **Sewage sortie** – Representatives from eight of 22 New Jersey municipalities that support the Passaic Valley Sewerage Commission met recently in a renewed effort to abolish the five-man authority appointed by the governor. This latest action by the communities, which finance the commission but have no voice in its operation, involves another attempt at putting a bill before the legislature (ENR Nov. 27, 1959, p. 25). A similar move, last year, was blocked even before reaching the Democrat-controlled Assembly.

• **Nuclear kilowatts**—Commercial production of atom powered electricity is under way at the 180,000-kw Dresden Station near Chicago. The $51-million nuclear power plant is financed by private industry.

• **Boom in Britain**—Factory construction in Britain promises to hit a new high this year, according to the government's Board of Trade. In this year's first quarter, 992 factory construction proposals were approved. That represents a production area of 34.4 million sq ft.

• **Diggers get a tunnel**—The government of New Zealand approved a financing plan for a 6,500-ft road tunnel through the hills that separate Christchurch, on the South Island, from its port of Lyttleton. The project will cost about $9.1 million and take a year to build. Bids will be advertised for late this year.

• **Texas-size project**—Plans have been announced for a $35-million development covering 511 acres in Richardson, Tex. The project will include a $2-million country club, a $3.5-million shopping center, a $3-million apartment project, and 500 homes estimated to cost $25 million. Clifford Cassidy, Jr., president of Richardson's Cassidy Feed Mills, and Clifford Owens, president, Owens Country Sausage, Inc., head the development group.

• **Providence motels**—Meyers Bros. Parking System has announced plans for a 20-story, $4-million motel in downtown Providence, R. I. This follows on the heels of another announcement to construct a 20-story motel, costing $3.5 million, just a block away. Herbert Y. Mason and Howard L. Winegrad of Providence are the competing motel builders.

• **Jersey industrial park**—Land clearing operations will soon start on Clover Leaf Industrial Park, an $80-million development of 2,000 acres scheduled for subdivision into industrial, commercial, and residential construction. The site is located near Mays Landing, N. J., 14 miles from Atlantic City.

• **Russia's Czech mate**—Czechoslovakia's new 25-year roadbuilding program gives priority to a 320-mile expressway that will connect Prague, via Brno and Kosice, with the eastern border it shares with the U. S. S. R. The program is designed to enlarge Czechoslovakia's existing 75,000 miles of highways to cope with increasing cross-country traffic.

• **New York hotel**—New York City is to get a 21-story, $9.5-million hotel, overlooking the Hudson River. The River View Hotel is planned to include five stories and basement garage, and two penthouses. Glickman Corp. is the owner; Morris Lapidus, Kornbluth, Harle & Liebman, the architects; Diesel Construction Co., Inc., the builder. All are of New York City.

• **Airport expansion**—Construction on a $4-million Municipal Airport expansion program in Birmingham, Ala., will start this spring. The project will include a $2-million terminal building and a $1.5-million privately owned motel.

House Votes the Usual For ABC—$925 Million

The House of Representatives last week voted to continue authorizations on the primary, secondary and urban (ABC) federal-aid highway systems for fiscal years 1962 and 1963 at $925 million—the same amount authorized for fiscal 1961.

The money comes from the Highway Trust Fund and is matched on a 50-50 basis by the states.

The House action, almost sure to be approved by the Senate, came despite strong requests by the Administration to cut back ABC authorizations to $900 million a year for the next two fiscal years until incoming tax money builds up a reserve in the Trust Fund.

The House also authorized some $239 million for federal roads in national forests and parks over the same two-year period.

House Unit Asks Cut In Military Construction

A $300-million cut in the Administration's proposed military construction budget for fiscal 1961 has been reported by the House Appropriations Committee.

Total appropriations, as recommended by the committee, would now come to $885 million, compared with the Administration's $1.2 billion.

The committee recommendations are about $500 million below actual appropriations for the present fiscal year.

Biggest single cut came in the Air Force allocation—almost a $200-million slice—leaving that service $525 million. The Army was cut about $60 million to $169 million; the Navy was cut about $33 million, to $161 million.

The House group, in approving the reductions, prodded the Pentagon for lack of adequate planning. "Realistic planning and programming is essential," the committee said, and "all too frequently the services find themselves in the position of building facilities which are at best only partially utilized. . ."

Specifically, the committee took these actions:

• Denied funds for commissaries requested in the budget.

• Commended the Pentagon for issuing common guide specifications for plumbing and hardware in the military housing program.

• Denied funds to the Navy and Air Force for duplicating test facilities for inertial guidance systems and directed the Pentagon to study the possible integration of the proposed facilities.

• Turned down numerous major building projects at U. S. military bases throughout the world, pointing out that adequate existing or alternate facilities were available.

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AT A LARGE NEW ENGLAND QUARRY

AMSCO CHUTE PLATES LAST 5 YEARS VS. 4 WEEKS FOR PREVIOUS TYPE

In the screen house of this quarry, two Amsco HC-250 abrasion-resistant chute plates are used on each Hi-G discharge screen. 500 tons per hour pass over each plate, during the two-shift, 20-hour operating day.

This installation resulted from a previous test, in which a set of Amsco plates was compared with regular carbon steel plates. The Amsco Chute Plates *lasted about 5 years,* whereas the competitive plates had to be replaced every 4 weeks.

The quarry operator reports that the Amsco plates presently installed are holding up excellently in service. Their exceptionally long life and trouble-free service means big dollar savings—through elimination of costly shutdown time.

ON THE NIAGARA POWER PROJECT

AMSCO SIMPLEX 2-PART TEETH DIG 40,000 YARDS OF ROCK BEFORE REPLACEMENT

At the right, you see the type of rugged rock excavation in which this outstanding service record was set. It's part of the Niagara Power Project—Conduit #2 South—being handled by Gull & Defelice Construction Company.

All dippers on the job are equipped with Amsco Simplex 2-Part Reversible Teeth. They operate 16 hours a day, 6 days a week—*handle approximately 40,000 yards of rock*—before tooth replacement is required.

In addition to their exceptionally long wear, the fact that Simplex Teeth *can be replaced in ten minutes with no trouble* is an important advantage to the operators. It all adds up to big savings—in replacement cost and shovel downtime.

*Patent No. 2,904,908

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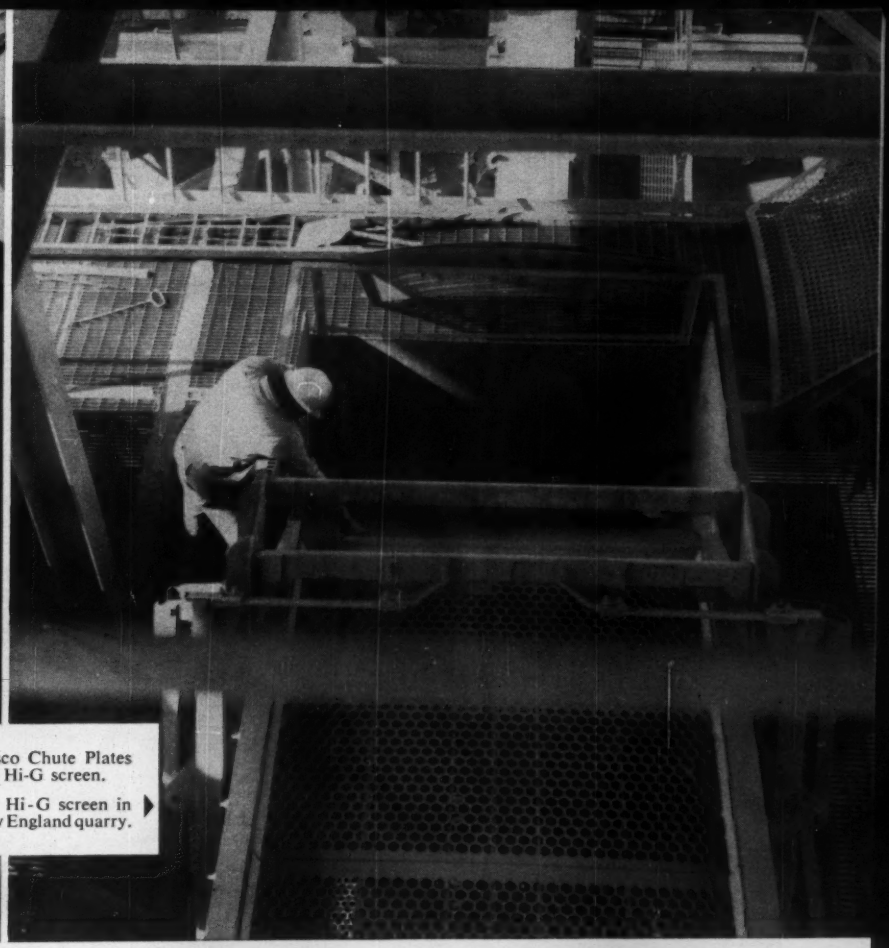
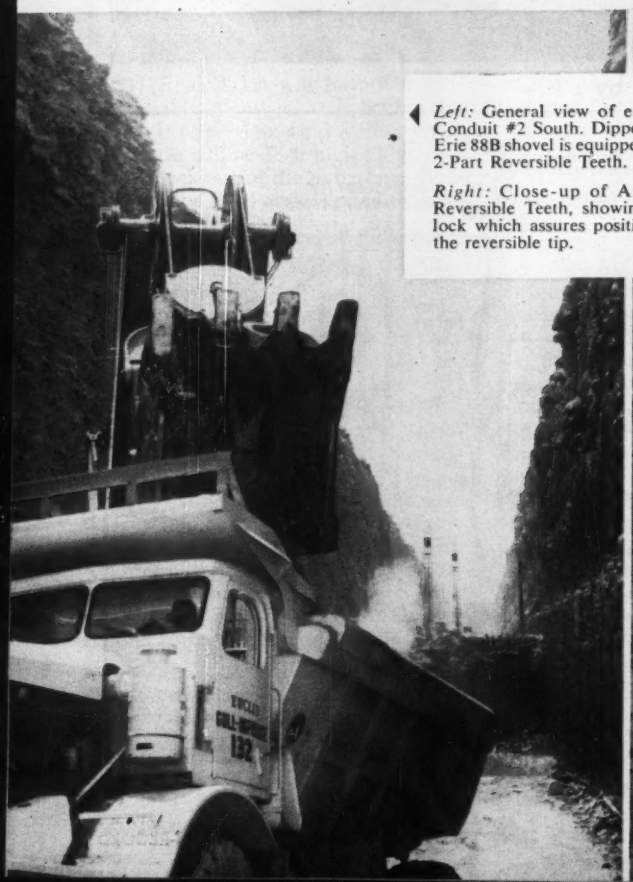
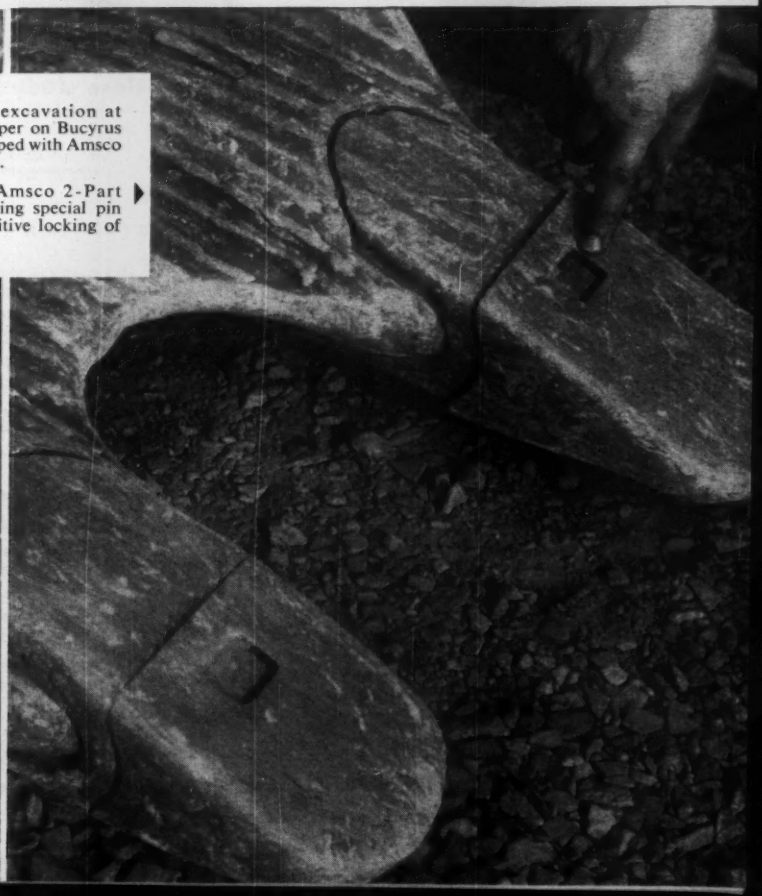


Left: Close-up of Amsco Chute Plates used on each discharge Hi-G screen.

Right: General view of Hi-G screen in screen house of large New England quarry.

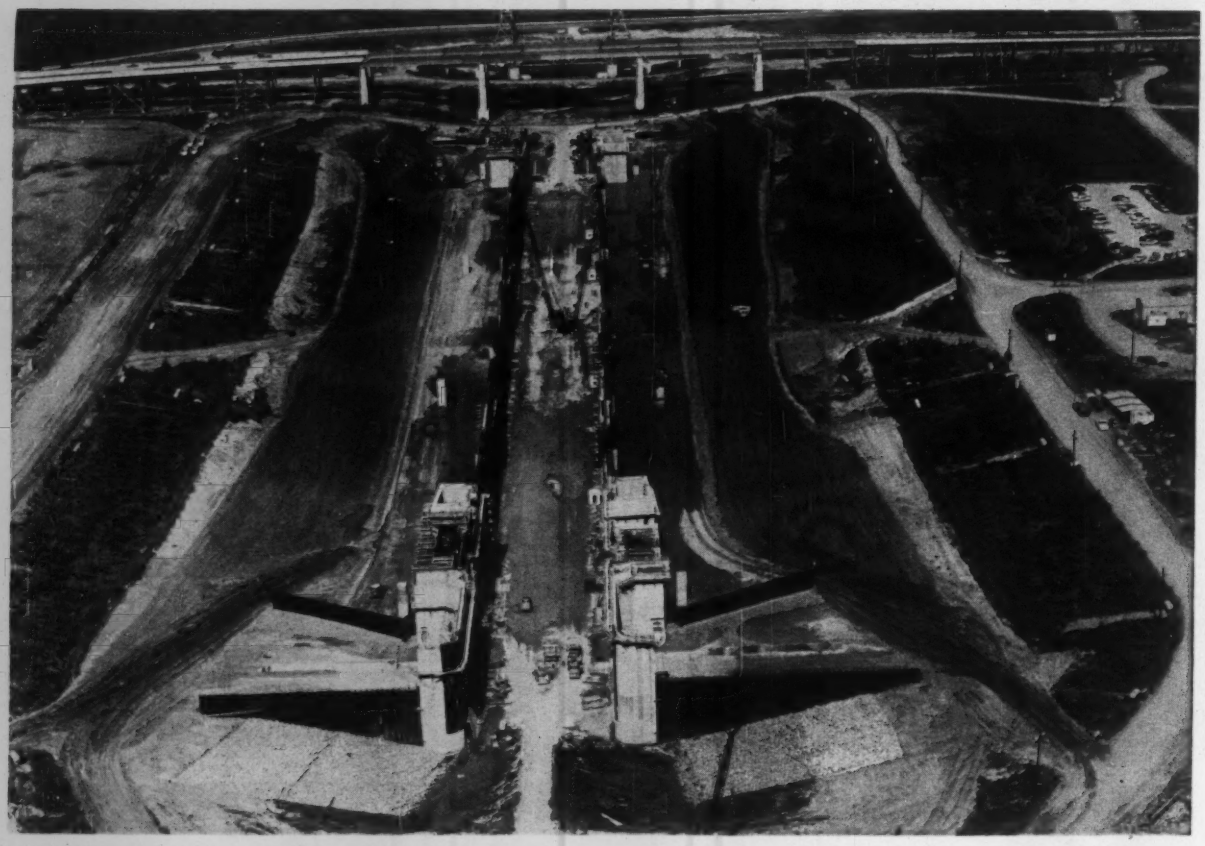




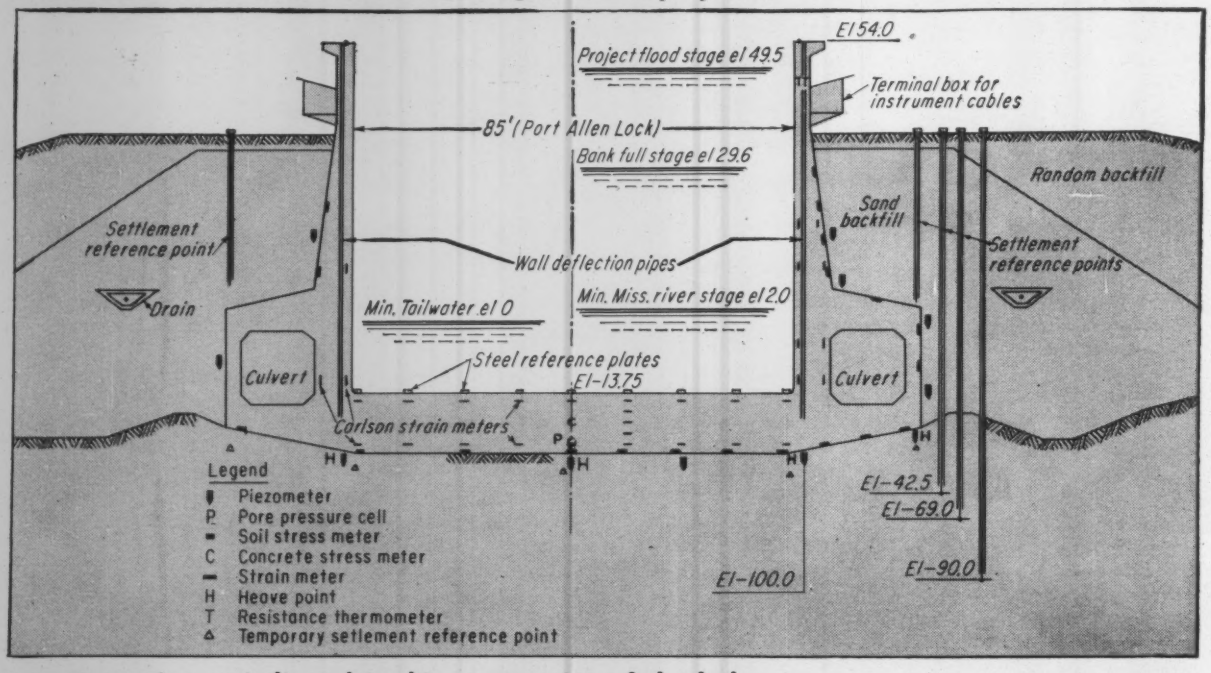
Left: General view of excavation at Conduit #2 South. Dipper on Bucyrus Erie 88B shovel is equipped with Amsco 2-Part Reversible Teeth.

Right: Close-up of Amsco 2-Part Reversible Teeth, showing special pin lock which assures positive locking of the reversible tip.

Corps' Tests on Two New Locks



Port Allen Lock is one of two locks getting close study by . . .



Instrumentation as indicated in this cross-section of the lock.

May Achieve Future Economics

By Robert I. Kaufman

A number of questions on design of navigation locks in the Lower Mississippi Valley will be answered by large scale tests at two locks now under construction. The objectives are more accurate design and more economical structures.

The Corps of Engineers uses two basic types of navigation locks on the inland waterways in that area. One has separate walls and a thin floor slab with pressure-relief openings. Walls may be reinforced or mass concrete. The other is a U-frame or dry-dock type structure. Occasionally a combination of both types is used.

Both locks being studied are the U-frame type. One is Port Allen Lock on the Intracoastal Waterway near Baton Rouge, La. The other is Old River Lock near Carr Point, La. (ENR Jan. 7, p. 32).

Both locks will be instrumented to determine the stresses and strains that develop in the lock structures and foundations.

Port Allen Lock will consist of a reinforced concrete U-frame with a usable chamber 84 ft wide by 1,200 ft long. It is being constructed directly upon alluvial soil without the use of bearing piles. The floor slab rests on 40 to 80 ft of clayey silt underlain by about 100 ft of pervious sand. Lock walls will be 68 ft high.

Old River Lock will have a 1,200x 75-ft usable chamber. It is being built on 100 ft of pervious sand without piles. Lock walls will be 78 ft high. The gates at both locks are of the miter type. Both locks will be filled and emptied through longitudinal wall culverts with side ports.

Designing a U-frame lock includes proportioning the walls and floor slab to withstand the applied loads. These loads include horizontal earth and water pressures acting on the walls; the weight of structure, backfill, and water in the lock; and uplift and foundation pressure. In addition, the gate thrust must be considered at gate bay monoliths.

Port Allen and Old River locks were designed so that the computed elastic and plastic deflections of the floor slab would be compatible with the computed differential settlement of the earth foundation. This was done by assuming two or three distributions of foundation pressure, then computing the structural deflection and foundation settlement for each pressure distribution.

The distribution selected for design was that which resulted in equal differential movement of structure and foundation. It was obtained by interpolating between the above results.

Since lateral earth pressures against the walls depend on the deflection of the walls and floor slab, the accuracy of the assumed lateral earth pressures is limited. Also the foundation pressure distribution may not coincide with the computed distribution since it depends on the wall loads and the elastic and plastic properties of the structure which vary with time and load.

In view of these uncertainties, a conservative approach is taken when making design assumptions and selecting values for design. The above method of design is regarded as the most rational procedure available to us. But it is limited by the degree of precision to which earth and foundation pressures and deflections can be determined. To improve it, we must be able to predict better the magnitude and distribution of earth and foundation pressures and the structural deflections.

Elimination of such uncertainties will lead to the construction of more economical locks in the future.

Moving in this direction, the Chief of Engineers initiated a program to measure the structural behavior of both the Port Allen and Old River locks so that future similar locks can be designed with more certainty.

At Port Allen Lock, the testing involves installing and observing the following:

- 25 soil stress meters (earth pressure cells) to determine the lateral earth pressures behind the lock walls and foundation pressures beneath the lock.
- 3 stress meters for concrete and a pore pressure cell to determine the maximum compressive stress in the concrete base slab.
- 33 strain meters and 8 wall deflection pipes to determine deflection of the structure.
- 33 piezometers to measure hydrostatic pressures beneath and adjacent to the lock.
- Numerous settlement reference and heave points to determine the amount of settlement of the foundation and structure.

The concrete temperature, which is obtained from the stress and strain meters and two resistance thermometers, must be considered since some deformation is expected due to variations in temperature.

Samples of concrete and steel from the structure are tested to obtain specific data on the behavior of these materials under stress. The creep test data for the concrete so obtained are required to compute stress in the concrete due to applied load.

Most of the instruments at Port Allen Lock are in monolith 15, as indicated in the accompanying sketch. The lock cross-section, program of instrumentation, and location of instruments at Old River Lock are similar to those at Port Allen Lock.

Each instrumentation program will cost about $150,000 or 2.5% of the cost of the reinforced concrete in each lock. Thus, if we find that the thickness of the structural members or the amount of reinforcing steel in future locks can be reduced, the savings in new construction will repay the cost of this research program.

The engineering measuring devices are observed at about monthly intervals during construction and will be observed the first three years the locks are in operation. Many of the computations to be made to analyze the data thus obtained will be done by electronic computer.

The results will be correlated with the design. Through analysis and study, any required revisions to the design assumptions and procedures will be determined and design rules established to serve as guides in the design of future similar structures.

Furthermore, as the present design procedures are tedious and complex, the results of the program will be reviewed with a view toward simplifying them where possible.

Ideally we would like to develop a program by which the most economical lock section can be designed by electronic computer taking into account the elastic and plastic properties of the lock structure, and the properties of the earth foundation and backfill.

Port Allen Lock was designed by the Lower Mississippi Valley Division, assisted by the U. S. Waterways Experiment Station. It is being constructed by T. L. James and Co., Inc., Ruston, La.

Old River Lock was designed by Bedell and Nelson Engineers, Inc., and A. W. Thompson and Associates, assisted by the New Orleans District, Corps of Engineers. It is being constructed by Brown and Root, Inc., Houston.

Construction of both locks is supervised by the New Orleans District. The engineering measurements are obtained by the New Orleans District and the Waterways Experiment Station, which is also analyzing the data.

Mr. Kaufman, chief of the Geology, Soils and Materials Branch, Lower Mississippi Valley Division, was in charge of foundation design for the Corps of Engineers on both locks tested.

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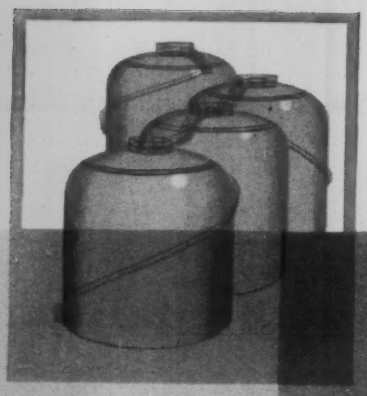

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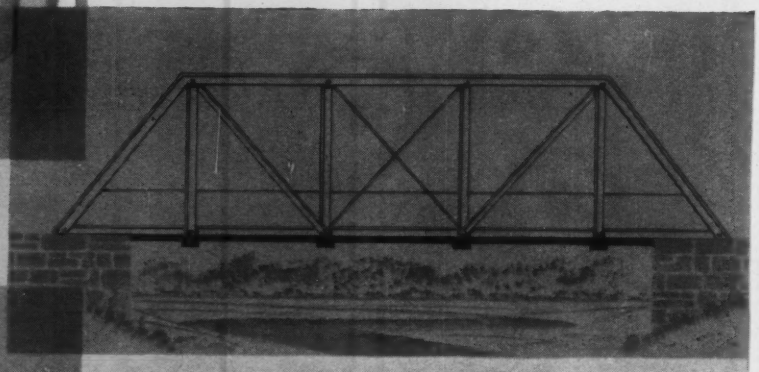

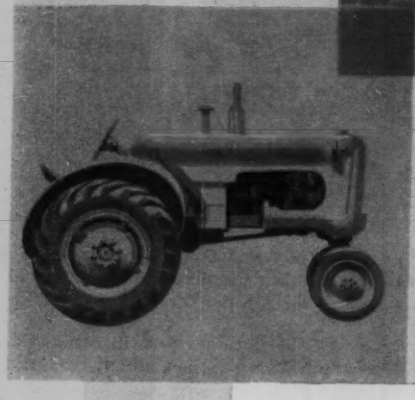

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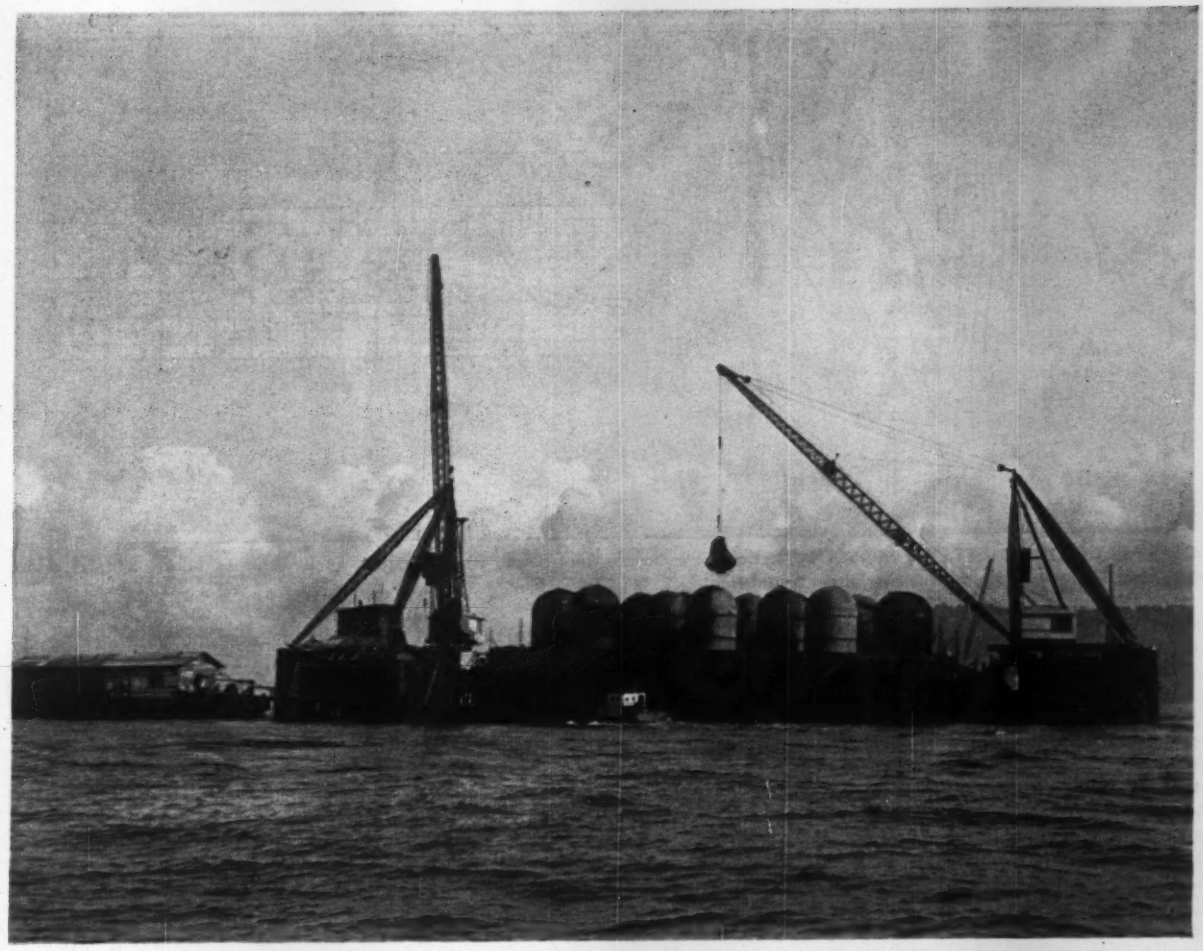


DOMES OVER DREDGING WELLS constituted a notable invention that permitted caissons on the San Francisco Bay Bridge to be sunk successfully to world record depths.

Foundations That Set Precedents

By Carlton S. Proctor

During the lifetime of our firm, which was born on May 1, 1910, when Daniel E. Moran hung out his shingle as a consulting engineer for foundations, a total of 2,300 commissions has been handled. A great many of these jobs presented memorable, challenges, but the dozen reviewed here are singled out because they included design innovations which have had pronounced impact on the art and science of foundation engineering.

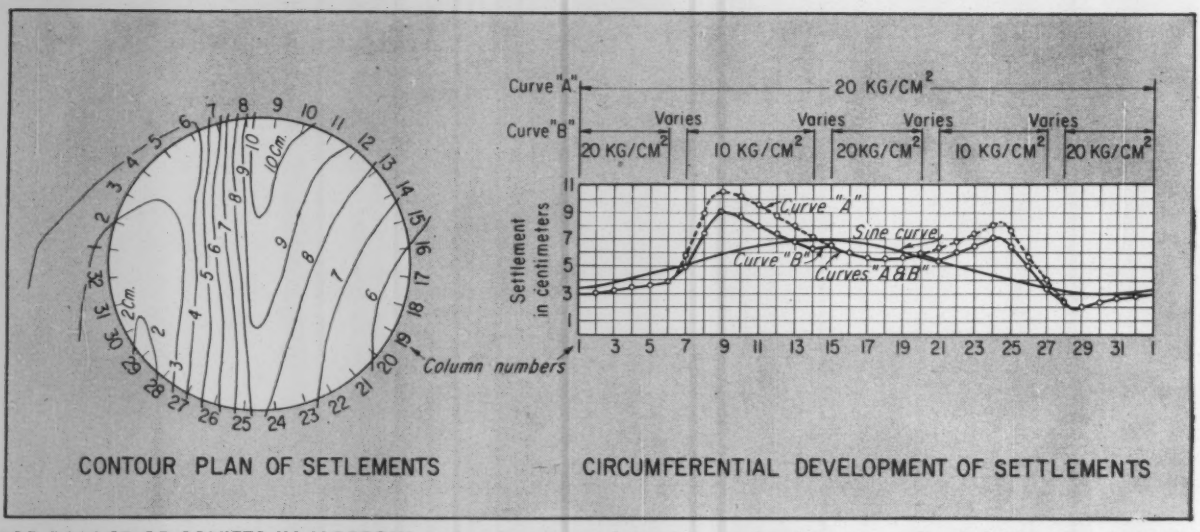
Mr. Proctor is senior partner in Moran, Proctor, Mueser & Rutledge of New York City, America's oldest consulting firm specializing in foundations—50 years old on May 1. ENR has asked him to review his firm's jobs that have contributed significantly to the art and science of foundation engineering. He and his partners selected the dozen that are briefed in this article as being of recent enough age to be usefully suggestive.

• **New York County Court House, 1921**—The foundation problem presented by the New York County Court House (ENR Mar. 24, 1921) led to a solution that was to be employed some years later in the foundation design for the Palace of the Soviets in Moscow. The site lay over old Collect Pond, a deep sump into the bedrock of lower Manhattan Island, where sand subsoil persists to great depth. The building, hexagonal in plan and 400 ft in diameter, presented six concentric rings of columns and walls to be supported.

Borings disclosed a sand and gravel deposit over the entire site extending from 33 ft. below the curb to the limit of the borings, 210 ft. Load tests showed that this deposit would safely support the building, but that settlements would be non-uniform. Since such differential settlements had to be avoided, six concentric rings of foundation girders were selected. Each girder was designed to transmit the entire load of any one column to the remaining part of that girder on the extreme and imaginary assumption that the soil under the adjoining two panels provided no support.

The adopted design employed an inverted T-section as a combination slab and girder. Uniformity of loading on the soil was obtained by varying the width of the T head, while the unit stresses in steel and concrete were adjusted by varying the thickness of the stem and the amount of reinforcement.

• **Palace of the Soviets, 1935**—A circular building that could not be subjected to differential settlements also posed the foundation problem for the Palace of the Soviets in Moscow. An average geological cross-section showed 70 ft of overburden on top of a 25 ft layer of undisturbed limestone, which was supported on a 25 ft bed of marl below



FOR PALACE OF SOVIETS IN MOSCOW settlement contours drawn from results of tests on undisturbed boring samples guided the proportioning of a continuous ring girder foundation.

which was a continuous bed of limestone. However, the actual departed widely from this average, particularly as to the character, compressibility and thickness of the marl and as to the thickness of the upper limestone layer. For economy it was required to found the building on this upper limestone.

The superstructure framing was unprecedented—two circles of columns on diameters of 525 ft and 460 ft, with a hemispherical dome springing from the inner circle of columns at the 100 ft level. The columns of the outer circle are set in from the vertical as they rise around this dome. Where they resume verticality above the dome, a ring girder is required. Any differential settlement would cause eccentric bending stresses in this girder.

Applying the results of laboratory consolidation tests on undisturbed samples of the marl, the amount of consolidation which would result from isolated column footings supported on this material was calculated for various intensities of loading on the top surface of the limestone layer. Vertical components of soil stresses at various depths, calculated by the use of Boussinesq's formula, showed that in the center of the depths of the compressible zones vertical soil pressures were changed less than 20% when the bearing pressure at the top of the limestone was decreased from 20 to 10 kg per sq cm. This indicated that the settlements under the heavy tower would be primarily a function of the thickness of the compressible materials, and would be affected only to a comparatively small degree by variations in the intensity of foundation pressures at the top of the limestone.

By use of the consolidation curves for undisturbed samples, settlements under assumed isolated piers bearing at 20 kg per sq cm were calculated, and contours of settlement sketched. This drawing (see illustration) also gave a circumferentially developed profile of settlements, and a profile of vertical consolidations, based on an intensity of 20 kg per sq cm where the tendency to settlement was least, and 10 kg per sq cm where the tendency to settlement was greatest. Superimposed on this last profile was a sine curve of anticipated consolidation under a continuous annular reinforced concrete girder carrying the tower columns. The departure of the profile from the sine curve determined the extent to which a continuous concrete foundation girder must distribute certain column loads to adjacent areas of lower compressibility.

The depth from the column bases to the top of the limestone layer being 72 ft, the annular foundation girder was made of this depth.

• **Yankee Stadium, 1922**—Borings at the site of the Yankee baseball stadium showed a thick deposit of boulders overlying a thick peat deposit. Bedrock being very deep, a design was developed whereby a grout fill converted the boulder deposit into a cyclopean concrete mat. On this mat, radial reinforced concrete slabs were cast to receive radial reinforced concrete girders 15 ft high, which supported the stadium columns. The girders were set into the concrete slabs, and insulated therefrom by heavy oil paper.

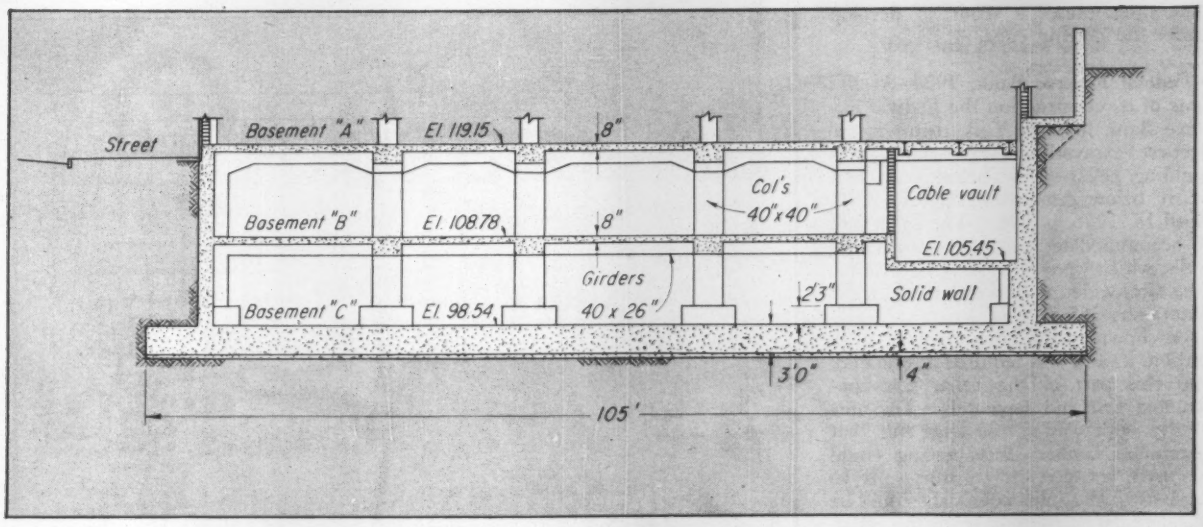
Each concrete girder included steel grillages above four pocketed openings to receive jacking beams and hydraulic jacks so that periodic compensation for mat settlement could be made. But when jacking was tried, it was discovered that it was impossible to lift the girders, even though jacking forces approaching the safe limit of the column strengths were employed. Interestingly enough, however, the jacking accelerated consolidation of the mat. By successive jackings, full consolidation was obtained.

• **Dade County Court House, 1928**—The Yankee Stadium jacking experience demonstrated that uplift forces, considerably in excess of the actual load on columns, could be resisted by the box action of the structure. This principle was used to arrest continuing settlement of the tower of the Dade County Court House in Miami, Fla.

The columns were first cut loose from their bases, and needle beams welded to the columns. Grillages were then placed on the concrete footings and jacks inserted between them and the needle beams. As the footings were jacked down, they compressed the supporting ojus rock so that, under loads greatly in excess of any structure loads full consolidation was accomplished.

• **Albany Telephone Building, 1929**—For the telephone building at Albany, New York (ENR Nov. 27, 1930, p. 826), rigidity and freedom from unequal settlements were necessary because of the delicate mechanisms that were housed in it.

The site of the building is a clay formation extending to a depth of over 100 ft to rock. Although, when first excavated, the clay appears to be a comparatively dry, firm material, it contains nearly 50 per cent by volume of water, and upon being worked or kneaded it soon becomes a soft, plastic mass. Not only does the undisturbed clay have a relatively low load-bearing capacity but any substantial loading will cause its gradual settlement.



CONTINUOUS MAT integral with a two-story rigid frame basement was the novel foundation design adopted to support the Albany telephone building on a yielding clay soil.

A study of the general proportions of the substructure developed the fact that it could be advantageously combined into a rigid-frame, two-story-and-mat structure acting as a unit over an area 105 x 72 ft to resist unequal settlement, variations in loads and the undesirable center sag. Since the cellar space requirement was secondary to the requirement for uniform settlement, walls, columns and floor girders could be increased in size and stiffened where necessary to resist moments and shears. The indeterminate character of the structure, particularly because of its two-story construction, caused us to resort to the use of elastic models loaded by Beggs deformeter gages to determine the stresses.

• **New Orleans Bridge, 1933**—For the foundations of the Huey Long Bridge over the Mississippi at New Orleans (ENR May 10, 1934, p. 589), a maximum depth of 90 ft of water and a shifting semi-fluid silt bottom required a light caisson to provide flotation, but adequately strong to withstand the hydrostatic pressure on the hollow walls during flotation. Minimum weight was also necessary because the subsoil material, a compacted sand, had a supporting power of only 4 tons per sq ft in excess of existing soil pressure. Opposing these requirements for maximum lightness was the need for sufficient weight to overcome skin-friction in sinking through sand, clay, gumbo, compacted sand and more gumbo to the then unprecedented depth of 185 ft.

This problem was met by a new type of caisson design, which extended the dredging wells virtually to the outer walls of the caisson, eliminating the usual thick, outer wall construction. It was also provided that certain portions of the caisson walls should be unfilled above the height required for the caisson seal. During caisson sinking, the hollow spaces not required for permanent construction were filled with ballast, which was removed when the caisson was landed.

When this foundation design was in preparation, soil mechanics was an infant science. Nevertheless, it was only through the application of soil mechanics, with laboratory equipment of pioneer design and fabrication, that the safety and adequacy of these foundations could be demonstrated.

• **San Francisco-Oakland Bridge, 1934**—Probably no other modern bridge has presented the unprecedented and fascinating problems in foundation engineering encountered in the West Bay crossing of the San Francisco-Oakland Bridge—two complete suspension bridges in tandem (ENR, April 5, 1934, p. 431). Borings developed the fact that the caissons must be designed to float during sinking to a maximum depth of 120 ft, and must then be sunk to bedrock at a maximum depth of 240 ft. This required sinking piers to a depth 50% greater and with a flotation depth 70% greater than had been reached on the Hawkesbury Bridge in New South Wales, which then held the record.

As the depths were far beyond the limit of pneumatic work, open dredged caissons were dictated. Also, the caissons had to have large horizontal dimensions because of the bridge loads and the heavy lateral forces from winds, currents and earthquakes.

All previous open-dredged caissons had employed either the braced cofferdam principle or a false bottom design. Neither would suffice here. To resist a 120 ft hydrostatic uplift, false bottoms would have to be very heavy, and their removal would be extremely difficult and hazardous. A braced cofferdam of the great size and strength required would contain such a forest of bracing as to reduce the area of the pier and thus weaken it.

After months of study of many different schemes, there was evolved and patented what has since become known as the Moran Caisson. Basically it is a cellular caisson provided with pneumatic flotation. This is accomplished by constructing the dredging wells as circular steel cylinders, extending well above the top of each caisson buildup and covered by steel domes fitted with valves and connections for the introduction of compressed air and for the later introduction of water as the compressed air is blown off. By properly proportioning the area of air-filled dredging wells to that of the caissons, required flotation is obtained; but in order that the center of gravity of the caisson should always be well below the metacenter, to assure a positive righting moment and to prevent the caisson from tipping, the caissons were provided with low head cofferdams in conjunction with the air-filled cylinders.

The Moran Caisson, as designed, provided 10% excess flotation effect, so that 10% of the domes could be removed at one time to permit building up the cylinders while the caisson was being sunk to the bottom. The caisson was designed to float with the water level within the wells not less than 10 ft above the cutting edge.

In addition to positive control during flotation, this caisson has the additional advantage that, as it approaches the bottom it may be quickly lowered to a firm embedment. The slow lowering required with conventional caissons

sometimes causes a scour to develop under the cutting edge.

• **Federal Reserve Bank, 1926**—At the time of its construction the Federal Reserve Bank in New York required the deepest excavation ever made for a building cellar—85 ft below curb and 62 ft below groundwater level (ENR April 15, 1926, p. 598). The cellar had to accommodate five stories within its walls, which were to be sunk as caissons. The site, wider at one end than at the other, was 365 ft long.

As shown in the accompanying illustration, a vault was required at one end, and this part of the cellar was constructed first and separately. The area of the vault was not so large but that temporary timber strut bracing could be used between its caisson walls to serve until the solid floor slabs could be installed. In the remainder of the cellar, however, only the bottom floor slab could be used for such permanent support since the slabs of the other floors could not be made continuous because of the presence of two banks of elevator shafts and the boiler room.

In this area, therefore, after temporary 12 x 12 in. timber bracing had been installed as shown in the accompanying drawing, heavy steel struts were set across the lot at each floor level in the narrow spaces between the elevator shaft openings. Designed for loads varying from 200 tons to a maximum of 750 tons per strut, these members gave effective lateral support to the caissons making up the long sidewalls of the cellar.

To provide bearing for these struts, specially reinforced pockets had to be precast in the caissons. To locate these pockets accurately it was necessary to predetermine the elevation at which the cutting edge of each caisson would stop. Boring data giving the rock level, therefore, had to be very accurate.

Another problem was to determine the stresses in the struts and the caissons at the strut bearings. Since this could only be done if the caissons were prevented from yielding inward when the timber bracing was removed, the steel struts were prestressed by jacking steel wedges between billets built into the strut sections. The amount of prestress was that required to balance the external pressures against the walls on the assumption that they furnished non-yielding supports.

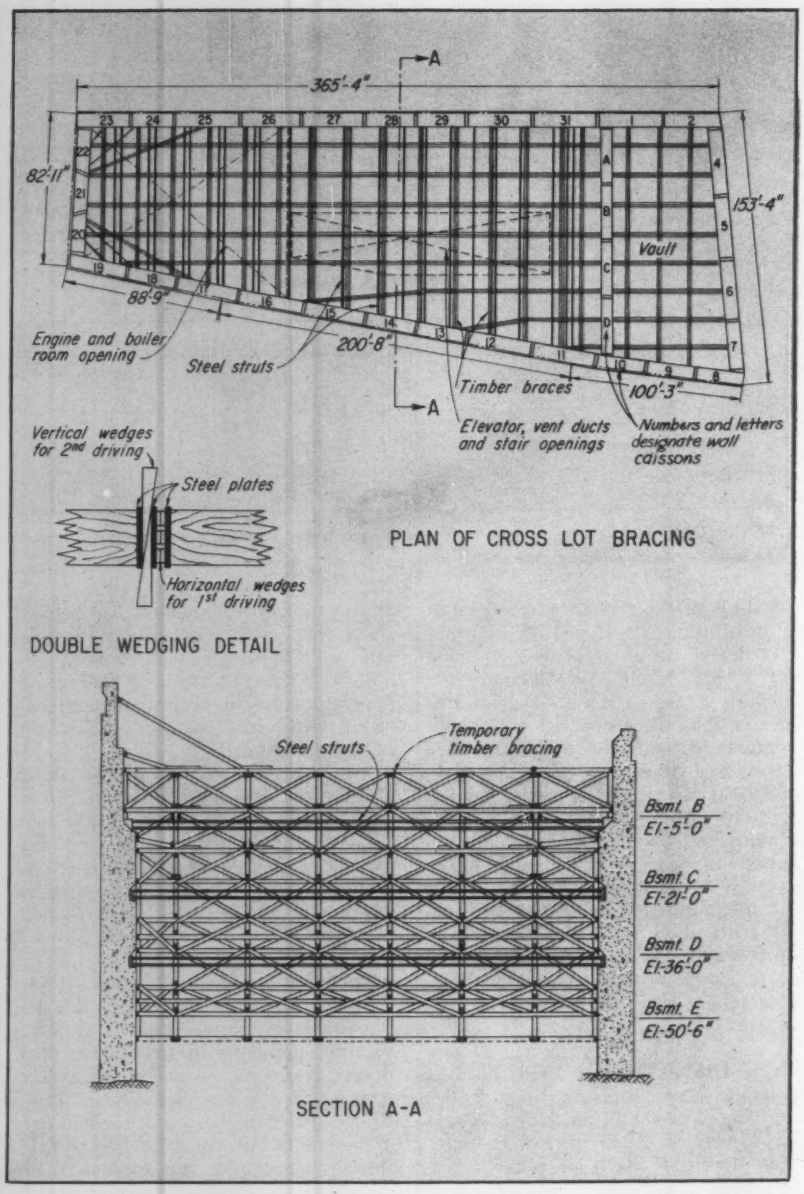
To justify this assumption it was necessary that the temporary timber bracing be stressed sufficiently to keep the walls from moving inward. To accomplish this a novel double wedging system was developed consisting of a vertical and a horizontal set of wedges which were inserted near each end of each timber. Both sets were driven between steel plates as indicated on the drawing.

This double system of wedging provided a load distributing medium consisting of the plates and the first set of wedges, so that a uniformly high stress at the end of the strut was developed when any single pair of wedges of the second set was being driven. With conventional procedures, using a single set of wedges, the timbers split before the necessary stress could be attained.

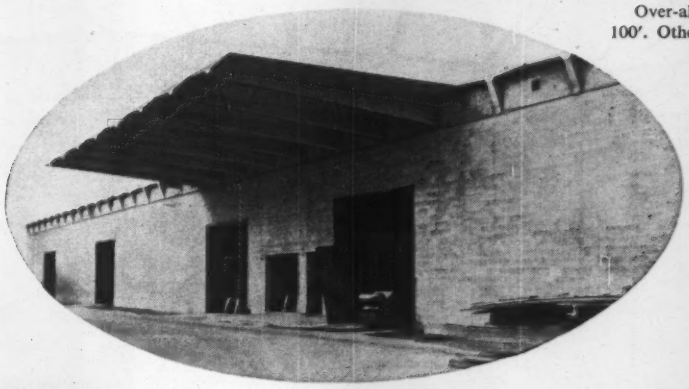
In the design, considerable thought was given as to the possible effect of temperature stresses in the steel struts. Measurements made after all wedging had been completed showed that for a drop in temperature the walls moved in almost as the temperature changed, but that with an increase of temperature the strut stresses would increase and then be relieved as the walls gradually moved outward. A total outward movement of the walls of $\frac{1}{8}$ inch (permitting a total increase of strut length of $\frac{1}{4}$ in.) accommodated the maximum variation of temperature during the readings.

These results are of particular interest since the question as to whether a deep cofferdam could move outward is one which had long been discussed. This was probably the first time that accurate measurements were made to answer the question.

(*Story continues on p. 50*)



PRESTRESSED STEEL STRUTS instead of the usual timber for caisson wall bracing was introduced in 1923 on the N. Y. Federal Reserve Bank building whose basement was deepest attempted up to that time.



Over-all length of cantilevered beams is 100′. Other 27 beams are 80′ long. All are 8′ wide at top and 3′ deep.

Single Tee Beams

FOR SPOKANE WAREHOUSE

Owner: Exchange Lumber & Mfgr. Company
Architect: Henry J. Swoboda
Structural Engineer: Jack M. Lyerla
Contractor: Walter G. Meyers & Sons
Prestressed Units: Central Pre-Mix Concrete Company
Concrete Block: Layrite Products Company
All of Spokane, Washington

Composed of just 35 prestressed concrete LIN TEE BEAMS, the roof of this building provides for an unobstructed floor area 80′ x 280′. And by adding a 20′ cantilever to eight of the beams, the loading entrance is given an attractive protective canopy.

Flexibility in design is only one of the reasons for the growing use of prestressed concrete in all types of construction. Others are its ease and speed of erection, low first cost, fire-resistance and negligible maintenance costs.

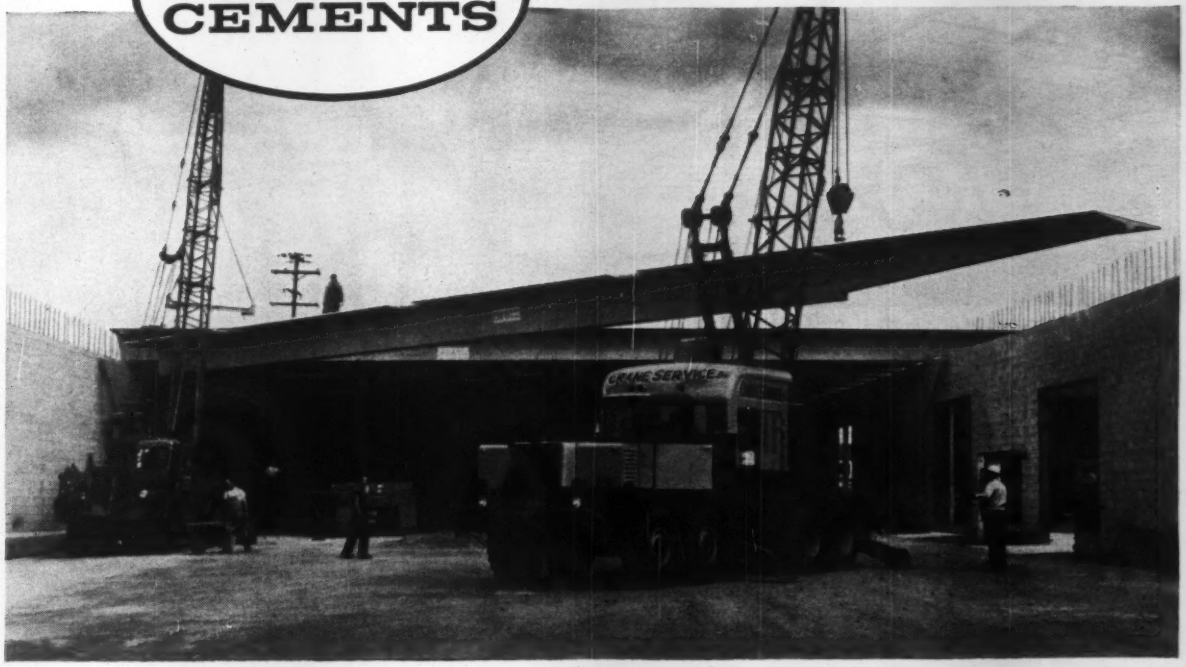
In the manufacture of prestressed units, such as these LIN TEES, Central Pre-Mix Concrete Company uses Lehigh Early Strength Cement. Like other manufacturers across the country, they have found that it affords them the most efficient, economical production cycle.

This is another example of the advantages of Lehigh Early Strength Cement and modern concrete construction.

Lehigh Portland Cement Company, Allentown, Pa.

LEHIGH CEMENTS

Two cranes place 100′ beam quickly and easily. Lehigh Early Strength Cement was also used in concrete block for masonry walls.



Expansive? Yes! Expensive? No!— Wide open spaces were achieved economically with no loss of rigidity . . . through the use of Ceco Steeldome construction . . . in Engineering Building No. 5 of Autonetics, a division of North American Aviation, Inc.

Architects & Engineers: Bechtel Corporation

General Contractor: Lindgren & Swinerton

Ceco quality-approved Steel Joists were used as purlins to support the roof of Building No. 5. Joists were erected quickly, providing fire-resistant, non-shrinking, vermin-proof construction.

Illustrated here is the use of Ceco Steel Joist purlins in another Autonetics building—Autonavigator Production Building No. 4—to provide light but sturdy non-combustible roof framing.

AGREED: **Two-way concrete joist construction provides wide, rigid spans**

BUT QUESTION: **How can this construction be economically achieved?**

ANSWER: **With CECO STEELDOME SERVICE**

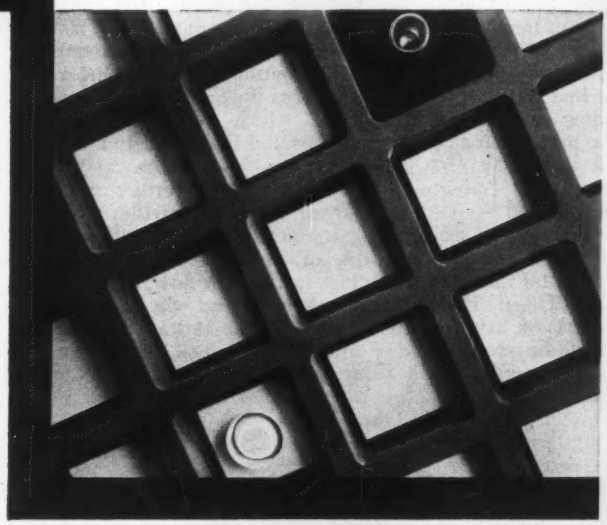
PROOF: If experience means anything, the acceptance of Ceco Steeldome service by architects, engineers, contractors and owners proves this: YOU CAN BEST DESIGN WIDE SPANS ECONOMICALLY WITH CECO'S TWO-WAY WAFFLE CONCRETE JOIST CONSTRUCTION. Building professionals accord Ceco unquestioned leadership in this field. Add Ceco's work in pioneering jet-air removal of Steeldomes for exposed concrete ceilings—and again you see Ceco in the lead. With Ceco Steeldome service you get these advantages:

1—Skillful workmanship in forming economical wide spans in monolithic concrete.

2—Workmanlike placement of Centering and Steeldomes. Dependable on-time delivery of fabricated reinforcing material.

3—Elimination of projecting beams without sacrificing rigidity, thus reducing story heights and facilitating installation of ducts and other mechanical equipment.

4—Surprisingly handsome ceilings of exposed concrete.



Straight-up view of two-way concrete joist construction formed with Steeldomes. In this unretouched picture, the exposed concrete has been painted and the voids treated with acoustical tile. Voids also provide a new convenience for the placement of lighting fixtures, ventilators and intercom equipment.

Backed by experience, we can say—nothing in the market tops Ceco Steeldome service. Project after project offers proof . . . so next time draw on Ceco's "library of experience" for better buildings of concrete joist construction. Ceco Steel Products Corporation. Sales offices, warehouses and fabricating plants in principal cities. General offices: 5601 West 26th Street, Chicago 50, Illinois.

CECO STEEL

IN CONSTRUCTION PRODUCTS CECO ENGINEERING MAKES THE BIG DIFFERENCE...

Steelforms / Concrete Reinforcing / Steel Joists / Metal Roof Deck
Windows, Screens, Doors / Cecoframe Buildings / Metal Lath

TOTAL MANUFACTURING FOR THE BUILDING INDUSTRY FROM RAW TO FINISHED PRODUCTS

• **New York Telephone Building, 1926**—The foundation design for the headquarters building of the New York Telephone Co. benefited from and further developed the steel strut bracing method used on the Federal Reserve Bank. The building occupies a 212 x 255 ft. rhomboid-shaped area and has five cellar stories, the lowest 70 ft 6 in. below the curb. One adjacent street borders the Hudson River and may be covered with water at extreme flood tides. Filled ground containing a great variety of materials, including timber and boulders, made the problem of lateral support of the cellar walls a difficult one.

Basement floors D and B (the top floor being A) could be designed as continuous slabs for lateral support but a boiler room and coal bunker cut through floor C. Based on the Federal Reserve Bank experience it was decided to provide the permanent wall support at this level by steel struts, but to install them in both directions. It was decided, too, that the steel struts could also serve as the temporary bracing if adequately supported and properly prestressed prior to excavating below C floor level, and prior to the installation of the building columns.

Timber bracing, wedged with the double system used on the Federal Reserve Bank, was installed in both directions down to basement C, from which level timber piles were driven to rock in groups of four at each point of intersection between north-south and east-west steel struts. These piles were cappped so as to provide both lateral and vertical support for the steel struts, and provision was made for adjustment to maintain perfect alignment. Each steel strut was built as a pair of members between which the colums could be admitted later.

After installing and supporting the entire tier of steel struts they were wedged up to about 60% of their ultimate permanent stress, and the excavation carried to subgrade. The amount of stress pre-wedged into each strut was made less than the ultimate to permit additional strut compression to be applied when the upper timber bracing was removed. Otherwise the walls, as they moved inward, would put into the struts much of the stress that should go into the slab of floor B, if it was to carry its proportion of the total.

• **Bank of Manhattan Building, 1930**—The foundations supporting the Bank of Manhattan Building at 40 Wall Street (ENR April 24, 1950, p. 691) are unique, and their method of construction aided the builder to complete the 71-story structure one year from the day on which he received possession of the property for wrecking purposes. Notwithstanding the serious handicap of working in the cellars of buildings in the process of being wrecked, foundations for the 104 columns required were installed in exactly one month. The procedure was to jack steel cylinders 42 and 52 in. in diameter through quicksand to a water-tight-seal in hardpan. Excavation to bedrock below the cutting edge of each cylinder was then made in the open. Steel reinforcement was placed and the cylinders concreted.

For many of the columns outside of the tower area, these cylindrical piers comprised the entire permanent foundation. For the tower columns, however, they had to be increased in area, although the cylinders provided adequate support until the building erection reached the 25-story level. Consequently, as column erection proceeded, the cylindrical piers under them were surrounded by steel sheetpile boxes driven to a seal in the hardpan, excavated to rock and filled with concrete to provide enlarged piers to carry the tower column loads.

• **New York World's Fair, 1938**—Flushing Meadow, the 1,200 acre site of the 1939 New York World's Fair, was a marine swamp, 1 to 2 ft above mean high tide. It consisted of organic clays and silts resting on sand and gravel varying from 15 to 80 ft below the surface. In addition, 50,000,000 cu yd of ashes had been dumped over an area of about 340 acres, in places forcing the meadow surface downward 30 to 40 ft below its original level.

It was determined that the major consideration in a grading and foundation program lay in the prevention and control of lateral soil movements in order to preserve the inherent "structure" of the clay-silt deposit and to prevent serious mud-wave flow. It was also determined that the ashes could be used for the 6,000,000 cu yd of fill that was needed (ENR Sept. 22, 1938, p. 361).

Soils laboratory tests dictated that the first layer of ash fill should be advanced with a depth of 4 ft, the remaining fill to be placed in one or two subsequent layers. Also, it was specified that no upper layer of fill should advance closer than 100 ft to the face of the previous layer, and that for the first layer no single unit of equipment used should exceed 10 tons gross weight.

This was only the second major operation of its kind, the first being the Oakland Mole approach to the San Francisco Bay Bridge where deep deposits of high-water-content, unstable organic silts were stabilized through consolidation methods designed to preclude remolding or displacements. It was on the Oakland job that sand drain piles were used for the first time—to drain the organic silt as the fill was progressively placed. Daniel E. Moran, who had invented and patented the sand pile some years previously, directed its employment.

The Flushing Meadow work offered the first major field demonstration of the marked increase in consolidation and the radical decrease in shear strength of remolded organic silt deposits versus undisturbed soils. On previous large fill operations, such as at LaGuardia Airport, the method used was to displace the silts ahead of the fill. Despite all efforts, however, large masses of remolded silts were inevitably trapped in the fill, with resulting excessive settlement and frequent slides in completely filled areas. At Flushing Meadow, where silt remolding was controlled, settlements of filled areas agreed to an almost unhoped for exactitude with predicted consolidations.

• **Rayon Plant in Tennessee, 1940**—The American Bemberg rayon plant at Elizabethton, Tenn. was supported on an alluvial overburden on top of a soluble, broken, limestone bedrock, honeycombed with solution channels and large cavities. This overburden had collapsed into many of these cavities causing "sink holes" extending to the surface of the ground.

A program for grout filling of overburden cavities was accomplished through drilled, cased borings. Borings were continued until 3 ft of continuous bedrock had been intercepted so as to insure against grouting over a thin rock shelf. A controlled introduction of repeated grouting closed off the rock floor openings by accretional cap grouting, after which controlled pressure grouting assured the complete filling of the intercepted overburden cavities.

By preventing the further ravel of overburden into rock cavities through the introduction of a grout mixture capable of arching over channels and openings in the rock floor, the loads of the overburden and the plant were transmitted to the bedrock at a safely low intensity.

Initially a grout pattern with holes at the corners of 20-ft squares was followed throughout the plant area, the first grouting being done where the hazard of further cave-ins was considered greatest. The second grouting pattern placed a grout hole at the center of each 20 ft square. Thereafter, drilling and grouting was concentrated in all zones where large overburden cavitation was indicated through large grout acceptance.

Outside of the buildings, in two rows 5 and 20 ft from the outer walls, 4-in. diameter churn drill holes, both vertical and inclined under the wall footings, were installed. Inside the building, 2½-in. diameter drill holes were used, including angle holes under all immovable equipment or inaccessible locations.

Thor

Everything you want in Crawler Rock Drills...

and more!

Thor's all new Crawler, Model TR-5, outperforms wagon drills three to one and every other crawler by quite a margin. One man operation. All-hydraulic controls completely flexible to maneuver mast and boom into any drilling position. Thor TR-5 is equipped with Thor model 140 4½″ drifter. Two 8 h.p. rotary air motors propel the compact drilling machine. Ask your Thor "Red Tool" distributor to show you the movie of this remarkable crawler. Thor Power Tool Company, Aurora, Illinois. Branches in all principal cities.

Thor POWER TOOLS

Who else...

...but **HOUGH** provides these facts?

This factual data on PAYLOADER four-wheel-drive, rubber-tired tractor-shovels in each of 1, 2, 3, and 4 yard sizes points up the advantages of their design, performance and safety features. Comparisons include all competitive units from manufacturers' printed specs as of April 1, 1960.

1 cu. yd. H-30 PAYLOADER

More Power: H-30 has 17% more horsepower than next most powerful machine in this category.

More Dumping Clearance and Reach: The H-30 has 4" more clearance and over a foot more reach.

Safety Boom Arms: All moving members pivoted in **front** of operator. **Exclusive** on the H-30.

Safety Ladder: Makes access to the operator's compartment easy and safe. Another **exclusive**.

"Full" Power-Shift Transmission: No manual shift, working to travel range. "PAYLOMATIC" transmission Hough designed and manufactured.

Four-Wheel-Brakes: Exclusive on the H-30 they permit equal stopping in both forward and reverse. Also sealed against dust and dirt.

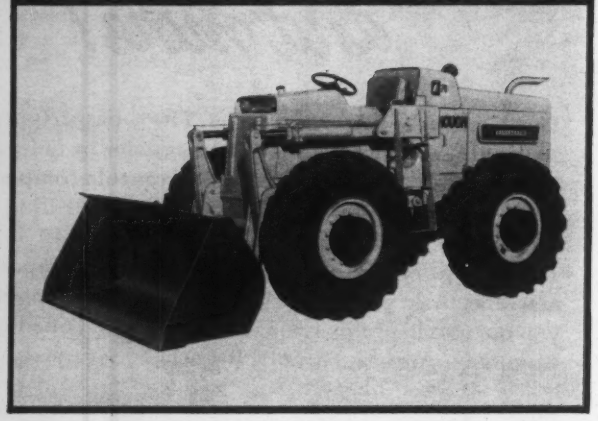
"Operator's Choice" Brake Pedals: Dual pedals give the operator a choice of braking with or without transmission engaged. H-30 **exclusive.**

Closed Hydraulic System: Sealed and pressure-controlled hydraulic reservoir with renewable cartridge-type filter and fine-mesh screen. Another **exclusive** H-30 protective feature.

Separate Oil-Cooling Radiator: A fan-cooled "oil-to-air" heat exchanger cools transmission and torque-converter oil. Another **exclusive.**

Easy Accessibility: No other comparable unit has H-30 accessibility. Dip stick, filler cap, batteries, connections and service points reached from ground level.

2 cu. yd. H-70B PAYLOADER



More Power: H-70 has more horsepower than the average of 9 competitive gas and diesel units.

More Dumping Clearance: The H-70 has 4" more clearance than average of 9 competitive units.

Safety Boom Arms: Underslung design keeps the operator safe from all moving members.

Safety Ladder: Makes access to the operator's compartment easy and safe. An H-70 **exclusive.**

"Full" Power-Shift Transmission: No manual shift from work to travel ranges. "PAYLOMATIC" transmission Hough designed and manufactured.

Four-Wheel-Brakes: Hydraulic, power-boosted four-wheel-brakes with separate parking brake. Front brakes sealed against dust and dirt.

"Operator's Choice" Brake Pedals: Dual pedals give the operator a choice of braking with or without transmission engaged. A Hough "first".

Closed Hydraulic System: Sealed and pressure-controlled hydraulic reservoir with renewable cartridge-type oil filter and fine-mesh screen.

Separate Oil-Cooling Radiator: A fan-cooled "oil-to-air" heat exchanger cools transmission and torque-converter oil. An H-70 **exclusive.**

Torque-Proportioning Differentials: Transfer up to 24% more power to best traction wheels.

Easy Accessibility: Extra attention has been given to providing utmost accessibility to all service points.

More Power: H-90 has 24 more horsepower than the average of 8 competitive diesel models.

More Dumping Clearance: The H-90 has 10" more clearance than average of 8 competitive units.

Safety Boom Arms: Underslung design keeps the operator safe from all moving members.

Safety Ladder: Makes access to the operator's compartment easy and safe. An H-90 **exclusive.**

"Full" Power-Shift Transmission: No manual shift from work to travel ranges. Improved units have better operating characteristics.

Four-Wheel-Brakes: Power air brakes with big braking area on all four wheels assures easy, safe handling of the H-90 at all times.

"Operator's Choice" Brake Pedals: Dual pedals give the operator a choice of braking with or without transmission engaged. H-90 **exclusive.**

Closed Hydraulic System: Sealed and pressure-controlled hydraulic reservoir with renewable cartridge-type oil filter and fine-mesh screen. Another H-90 **exclusive** protective feature.

Separate Oil-Cooling Radiator: A fan-cooled "oil-to-air" heat exchanger cools transmission and torque-converter oil. An H-90 **exclusive.**

Torque-Proportioning Differentials: Transfers up to 24% more power to best traction wheels.

Easy Accessibility: Extra attention has been given to providing utmost accessibility to all points requiring checking and service.

Power-Steering: All "PAYLOADER" four-wheel-drive units have hydraulic power-steering.

More Power: H-120 has 38 more horsepower than next most powerful machine in this category.

More Dumping Clearance and Reach: H-120 has 4" more clearance, 6" more reach than next unit.

Safety Boom Arms: All moving members pivoted in **front** of operator. **Exclusive** on H-120.

Safety Ladder: Makes access to the operator's compartment easy and safe. Another **exclusive.**

"Full" Power-Shift Transmission: Hough-built, full-reversing, constant-mesh, countershaft-type with balanced rotating hydraulic clutches.

Four-Wheel-Brakes: Power air brakes with large braking area assure easy, safe handling at all times.

"Operator's Choice" Brake Pedals: Dual pedals give the operator a choice of braking with or without transmission engaged. H-120 **exclusive.**

Separate Oil-Cooling Radiator: A fan-cooled "oil-to-air" heat exchanger cools transmission and torque-converter oil. Another **exclusive.**

Better Balance: Exclusive use of lightweight, extra-strong "T-1" steel for box-section boom arms saves over a ton of "dead-weight" on the load-carrying end.

Better Stability: Counterweighted by approved use of dry ballast material in rear tires. Lower center of gravity, 50% of weight below rear axle. **Exclusive.**

Protection: Special dry-type air cleaner gives 99.8% dust removal efficiency under most adverse conditions. Sealed, pressure-controlled hydraulic system has cartridge oil filters and fine-mesh screens. **Exclusive.**

Extras: Canopy-type cab with windshield wipers and special lights is standard equipment.

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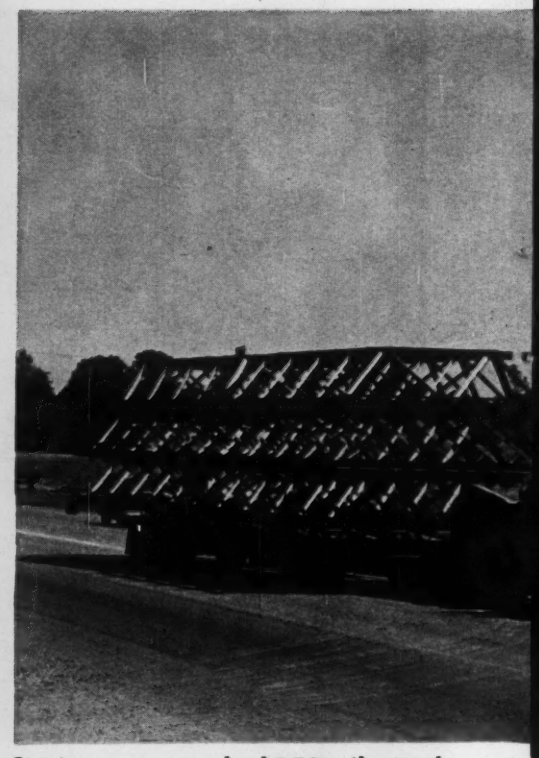
Fast roof erection at Upjohn Co. plant followed model tests.



Sections were trucked 150 miles to the

'Mass Producing' a 4-Acre Space

The magic words "mass production" keynote the construction of nearly 200,000 sq ft of space-truss roof for the new office building near Kalamazoo, Mich., of Upjohn Company, pharmaceutical manufacturer. They apply equally well to the fabrication, the transportation and the erection.

Construction schedules of the 450 x 450-ft, two-story office building contemplate initial occupancy the latter part of this year.

Erection crews started at one corner of the sprawling structure and erected the upper-level girders and beams and the space trusses. They worked in two directions from that corner.

A pair of cranes erected the steel. One crane with 110-ft boom and 30-ft jib hoisted the material into place. A smaller crane moved material from a nearby storage yard to within reach of the other. The erection sequence required the long boom to reach out 62 ft to set material in place over previously erected beams and trusses.

Ironworkers used five sets of erection bents to erect the space trusses, according to Maurice Bresnahan, construction superintendent for Whitehead & Kales Co., contractor on the steel work. Most of the shop work was welded, and all major field connections were bolted. About 49,000 high-strength bolts were required. Using pneumatic wrenches, erection crews applied a total load of 29,000 lb to ¾-in. bolts and 37,000 lb to ⅞-in. bolts.

Columns are spaced 48 ft c-c each way. They are all-welded and star-shaped for two reasons: To conform to the architectural plans, and to furnish equal rigidity against bending in either direction.

Workmen welded the columns to base plates, which were set on reinforced concrete spread footings. Welded cap plates atop the columns support the space frames, which are fastened to the plates with four bolts.

Keystone of economy in fabricating and erecting the 1,200 tons of structural steel in the space-frame roof was assembly-line mass production. Covering a total net area of 176,850 sq ft, the roof contains 303 shop-assembled sections and 12,266 loose pieces.

Whitehead & Kales fabricated all structural steel at its Detroit plant and trucked it to the site. There were 168 truck loads of space frames plus 66 loads of floor framing, according to G. Hunt Weber, Jr., project engineer.

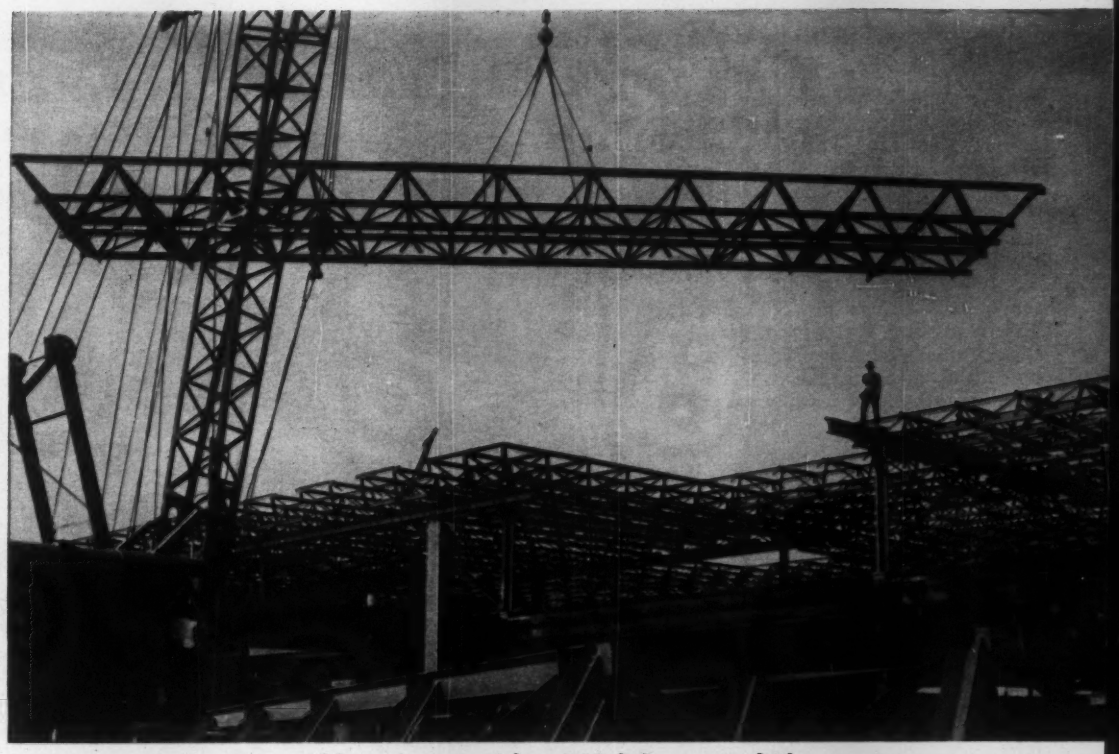
• **Model tests**—Engineers and key personnel in practically every department of Whitehead & Kales studied the job during the prebidding period for mass production possibilities.

Craftsmen made models of the standard truss sections to give better insight into the logical sequence of shop assembly and fabrication, as well as field erection. They also helped the shop foremen to become familiar with the job, and aided the fabricating crews in determining the amount of shop welding, beveled cuts, etc.

Every critical joint was tested to destruction in the model studies.

• **Careful assembly**—Top and bottom truss chords are composed primarily of tees. The fabricators developed a punch that split wide-flange or junior beam sections by punching a narrow slot along the center line of web. This was faster and more economical than any other method, said a company spokesman. It was also cheaper than buying sheared or split tees from the mill.

In all subassembly work, great care was taken to see that everything matched properly and would fit into its place in the final trusses. Any error made at that stage of fabrication would



site, where . . . **Space trusses were erected by a crane with a 140-ft boom and jib.**

Truss Roof

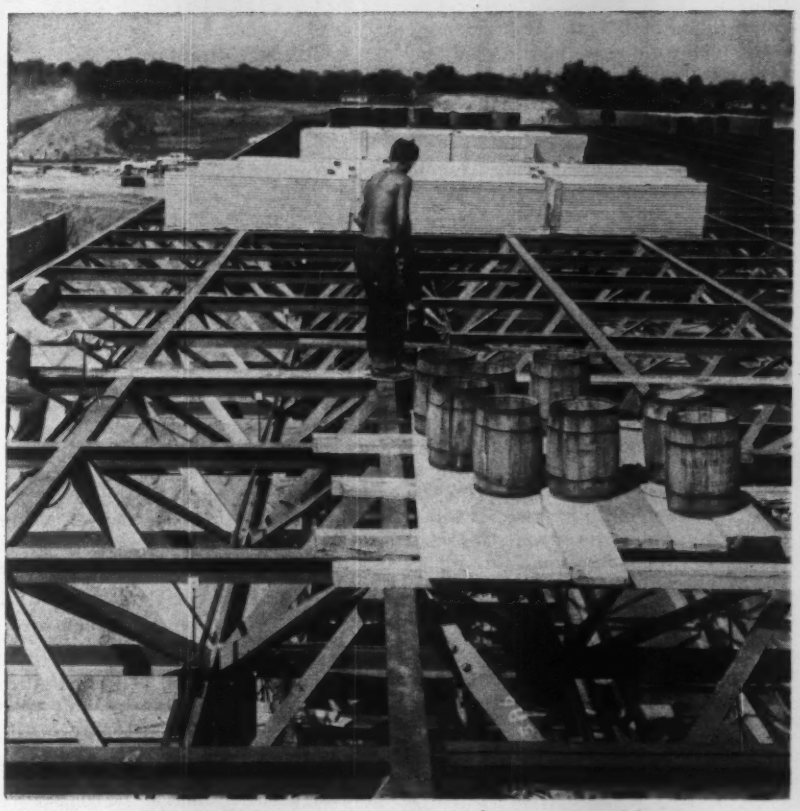
be multiplied hundreds of times in the final erection.

Welding had to be fast and economical, since there was so much of it. To speed the work, welders used a positioning table that could be rotated to position the members for downhand welding. Under full production, two big 66-ft space trusses were fabricated per day.

The shop-assembled sections were fabricated on a production-line basis that required both subassemblies and final assemblies. For the 606 top and bottom-chord subassemblies, there were six major jig set-ups and 25 minor changes to produce 49 different types of these assemblies.

Shop crews made seven major jig set-ups and 25 minor changes to produce 25 types of space trusses in the final assembly of the 303 shop-fabricated space trusses. The largest shop-assembled section was 15 ft wide, 66 ft long and 3 ft 3½ in. high.

Special low-boy and single-axle pole trailers in tandem, carried three frame sections per load to the job site. The contractor arranged with the Michigan State Police to convoy shipments consisting of three trucks. Truck drivers made the 300 mile round trip be-



Workers made field connections by bolting or welding.

tween Detroit and Kalamazoo in a working day.

• **Fast erection**—Steel crews erected the entire 1,200 tons of space-truss roof in 13 weeks last fall. This total tonnage of roof framing resulted in the economical figure of only 13.7 lb per sq ft.

Air-conditioning ducts and other utilities for both floors are carried in the framing of the lower level. Large round, square and rectangular holes had to be cut for them through the plate girders carrying the second floor. At these points the girders were "beefed up" with welded stiffeners.

Fireproofing for structural steel beams and girders is lightweight concrete, vermiculite plaster, or a direct spray-on material. Workmen apply it to expanded metal lath wrapped around the structural members or to welded wire mesh clipped to welded studs. Exterior beams are insulated for condensation, then fireproofed.

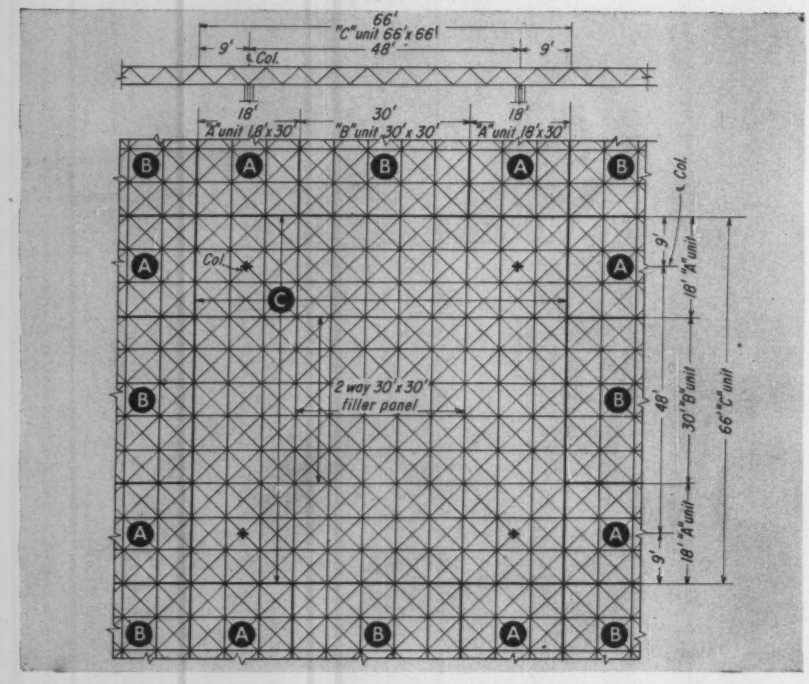
The space trusses carry a zinc-coated metal roof, covered with 1½ to 3½ in. of lightweight concrete. The top surface drains to roof sumps. Plastic flashing is used at expansion joints in the roof. Finished surface is conventional felt, coal-tar pitch and gravel.

About 24,000 cu yd of structural concrete, 1,700 cu yd of lightweight concrete and 1,250 tons of reinforcing steel are contained in the project. Concrete pours are limited to 10,000 sq ft of floor per day or 80 lin ft of retaining wall, to permit finishing in daylight.

Concrete is required to have a minimum compressive strength of 3,000 psi at 28 days. But the general contractor, O. W. Burke Co., Detroit, uses a 5½-sack mix that produces concrete of 2,800 psi in 7 days. This high-early-strength concrete is worth the extra cost, according to Stan Mendygral, construction superintendent, since it permits fast stripping of the forms.

Burke used 160,000 sq ft of prefabricated panel forms for his concrete. He detailed and fabricated them in his Detroit shops and trucked them to the site. The job requires 220,000 sq ft of retaining wall forming; 200,000 sq ft of forming for floor slabs; and 80,000 sq ft of footings and miscellaneous forming. Burke's construction crew, including subcontractors will hit a peak of about 400 this spring.

Although the fabrication and erection of the space trusses challenged the ingenuity and resourcefulness of the contractor, equally notable is the development of the design. Basic details are presented in the following article by Mr. Dunlap of Skidmore, Owings & Merrill, Chicago.



ROOF FRAMING PLAN divides trusses into A, B and C units. The C units project beyond columns spaced 48 ft c-c to support the A and B units.

Developing the Space-Truss Design

By William E. Dunlap

The space truss roof for the Upjohn office building, near Kalamazoo, Mich., was designed to act as a plate. The roof framing had to span 48-ft square bays. It also had to cantilever beyond the columns to provide a protective overhang for the perimeter glass areas.

Other design requirements were: The roof should permit openings for outdoor courts. And it should be economical in material, fabrication and erection cost.

Briefly, a space structure or space frame is a structural framework with its members arranged to act simultaneously in three dimensions. Of course all framed structures are space frames in some respects since they have depth, length and thickness. However, a true space frame can be distinguished by saying that such a structure possesses qualities of positive action in three dimensions.

As a first step in design, the roof framing was broken down into a system of independent units. This permitted optimum standardization of unit types and member sizes, in accordance with expansion-joint and roof-opening requirements.

A secondary advantage of the division was simplification of the mathematical analysis. Obviously, a fully continuous roof system would have required a more complex analysis.

The general design of three typical truss units—indicated as A, B, C on an accompanying sketch—was based on the following:

• **Unit C** was assumed to act as a two-way plate, with strips over each column line and a 30 x 30-ft two-way filler panel in the center. In addition to supporting its own load, Unit C was designed to support the A and B units on its perimeter.

• **Unit A** was designed to span in a one-way direction between adjacent C units. In addition to supporting its own weight, the A unit was designed to support adjoining B units.

• **Unit B** was designed as a two-way element, supported by adjoining A and C units.

After the initial mathematical stress analysis was completed, a diagram was prepared. On it, identical members in each unit were designated by a color code.

Load and stress patterns were traced visually on the diagram. This inspection spotted stress patterns ab-

Mr. Dunlap, associate partner, Skidmore, Owings & Merrill, directed the Upjohn Co. project through design and construction.

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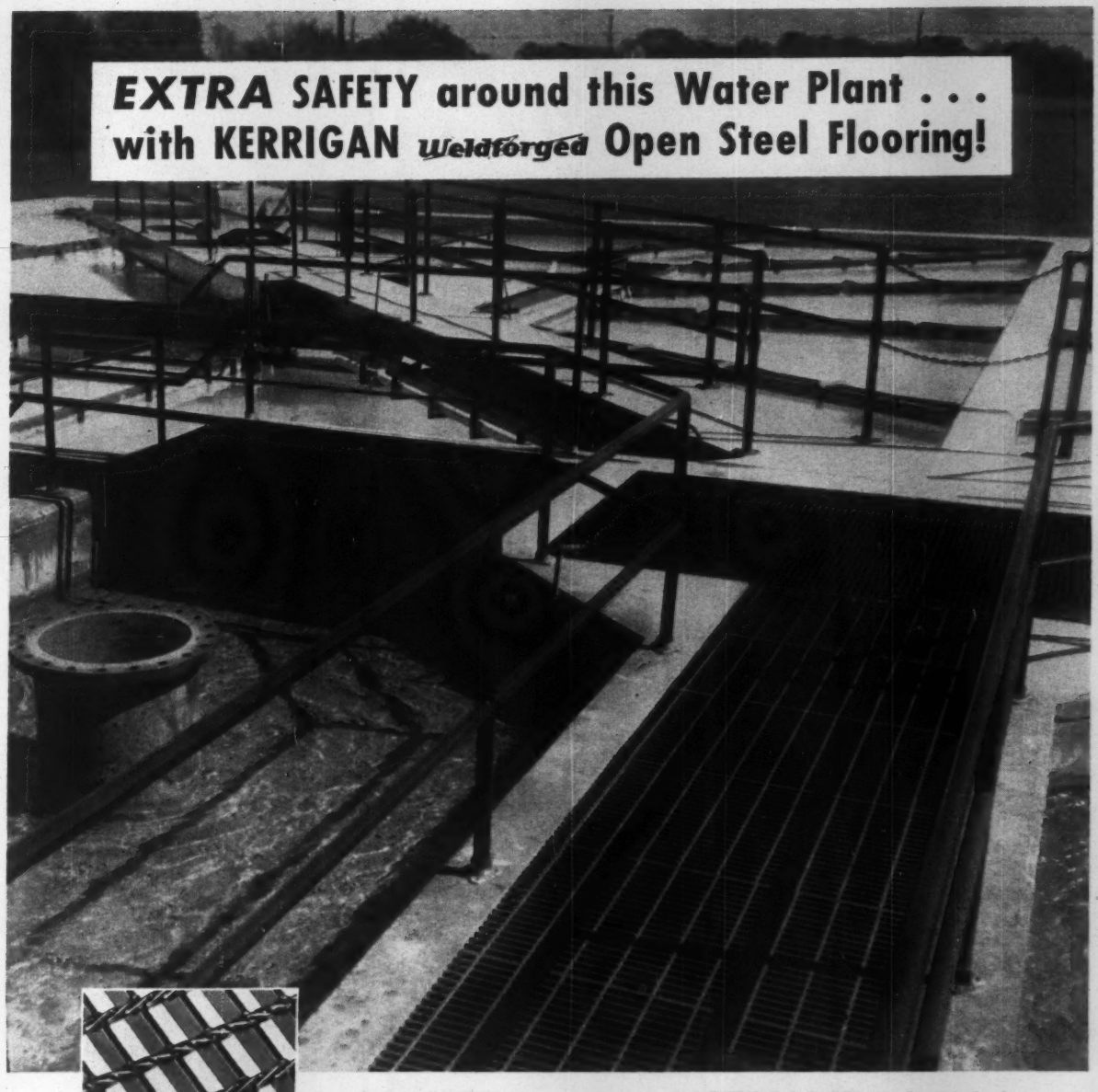

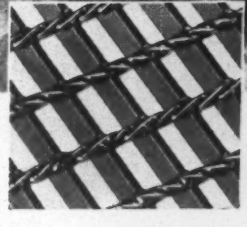

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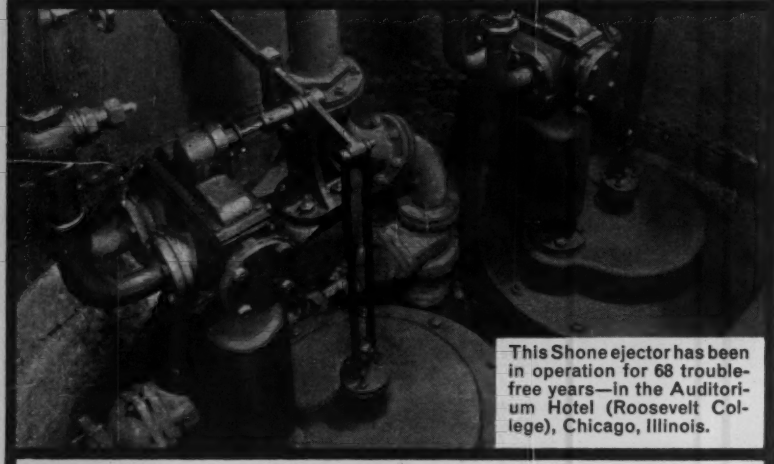

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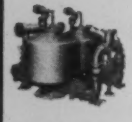

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normal to usual plate action, and consequently, adjustment was made in the stresses ascribed to certain members.

In addition, deflections were determined approximately by loading a reduced scale model made of plastic sheet and taking strain-gage measurements. From these data, lines of inflection were established and checked against the mathematical analysis.

This information led to adjustment in member sizes.

From the mathematical analysis, the visual inspection of the color-coded diagrams, and an appraisal of the lines of inflections and deflection patterns, a design for a full scale (66 x 66-ft) mock-up structure was prepared.

The purpose of this structural mock-up was to verify the mathematical computations and to resolve detailing, fabrication, shipping and erection procedures.

During the construction of the full scale mock-up a small plastic model of the space trusses was prepared. This model was loaded, and the stresses in all members were recorded. Certain members were then selected for stress verification in the full-scale mock-up. This procedure produced savings in the test program since the general behavior of the space trusses under load could be followed on the plastic model without the expense of running tests on all members of the full-scale mock-up.

The model studies and mock-up field tests compared very closely with the mathematically derived design. As a result of the tests, however, minor adjustments were made in the size of certain members and thus the final member sizes were established.

It is interesting to note that in the final design, the web and chord members were sized according to the actual stresses in these members; no attempt was made to standardize them for theoretical mass-production economies.

Economy of this structure was made possible by the close working cooperation between the architect-engineer and the fabrication shop in developing a design that was adapted to shop fabrication and the shipment of large sections.

Engineers of the Upjohn Company connected with the project included: L. M. Crockett, vice president of engineering; B. S. Lane, director of engineering; A. A. Hilgart and W. H. Sisson, chief engineers.

William Sharrar is Burke's general superintendent, Edward Webster is project manager, and John E. Mueller is chief engineer for Whitehead & Kales.

Skidmore, Owings & Merrill's Bruce J. Graham was senior structural designer and Steve Tang was senior structural engineer for the project.

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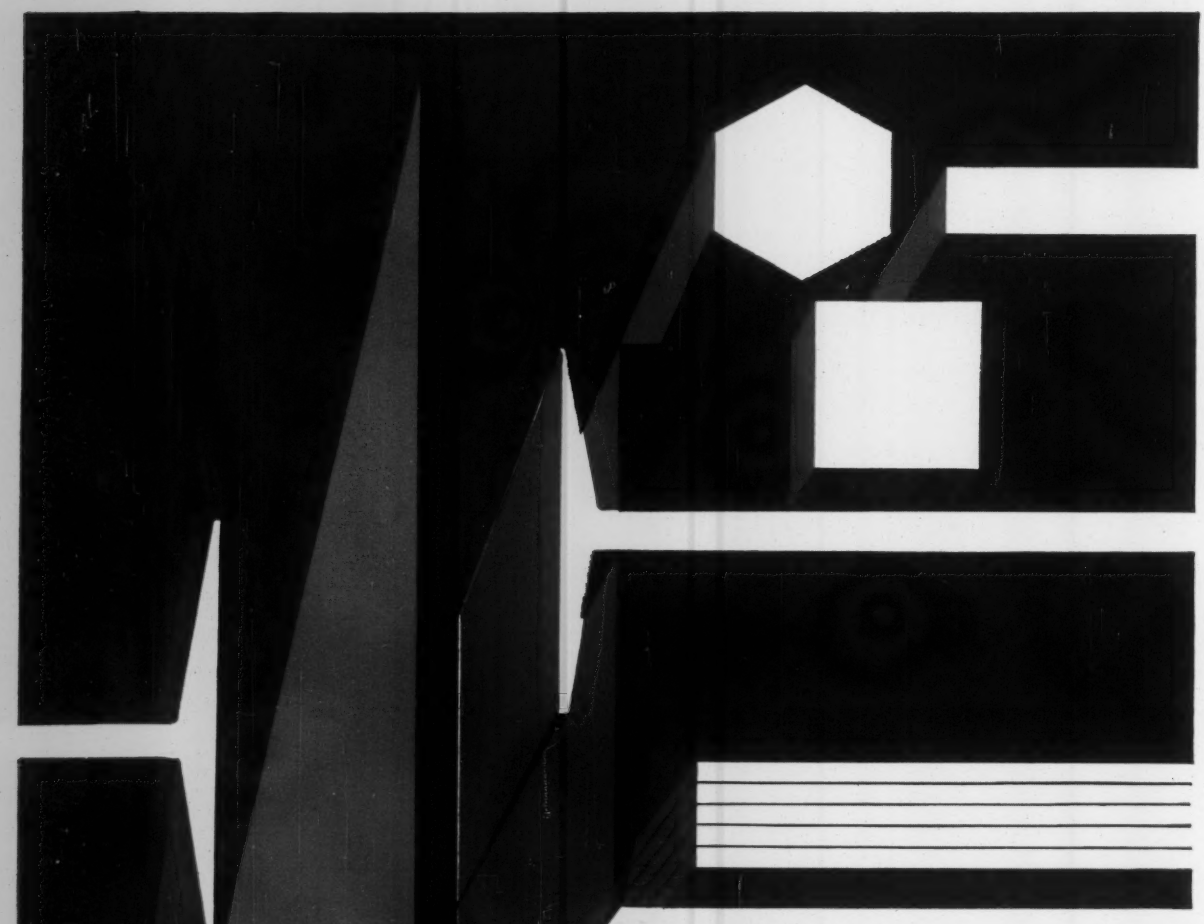

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Cause of acid pollution in streams is drainage from mines and mine-refuse areas.

Effects often are fish kills and water too hard for home or industry.

New Look at Acid Mine-Drainage

It took a tough resolution by a progressive regulating agency to make coal-mine operators in the Ohio River Valley take a new look at stream pollution caused by acid mine-drainage.

What they saw wasn't pretty. **The contamination of water from acid mine-drainage is one of the major remaining pollution problems in the valley.**

Stimulated by the aggressiveness of its eight sponsoring states, Orsanco—the Ohio River Valley Water Sanitation Commission—adopted the resolution earlier this year and now has a campaign under way to ameliorate the situation.

Positive steps can be taken to minimize such pollution, according to Edward J. Cleary, executive director and chief engineer of Orsanco. Basically, they are aimed at reducing water flow into the mines; reducing contact time between the water and the acid-forming materials; and proportioning discharge according to stream flow over a 24-hour period instead of discharging "slugs" of acid water.

Adoption of the control measure represents an important change in prevailing attitudes. **Orsanco has never accepted the view held in some quarters that nothing could be done about controlling mine-acid discharge.**

Bit by bit, it gathered evidence which demonstrated that the situation was not hopeless.

Much of the evidence came from experiences in Pennsylvania and Indiana, where state pollution agencies and operators had tackled the problem and achieved some notable success.

Mine drainage seriously degrades water quality, according to F. W. Montanari, Orsanco's staff sanitary engineer, who has been devoting his major efforts to the problem. These drainage waters frequently contain acid formed by three components: sulfurous material (usually pyrites), air and water.

In addition to destroying aquatic life, mine drainage often renders water unfit for domestic or industrial use due to its corrosive nature. In some cases it results in a disagreeable-looking stream.

The acid component of mine-drainage may also react with alkaline substances in the earth, adding to the hardness of

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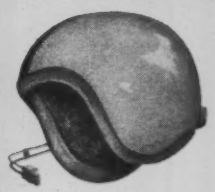

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the water. Hard water, unfortunately, is not desirable for either domestic or industrial purposes. Mine drainage also contributes such undesirable elements as iron, manganese and aluminum.

Traditionally there has been a spirit of defeatism with regard to control of acid mine-drainage. This has been fostered by a school of thought which takes refuge in the theory that until research reveals the scientific mechanism involved in the formation of acid it is fruitless to try to control polluting discharges. Without disparaging the virtues of basic research on the problem, at least two of the states signatory to Orsanco have insisted—and demonstrated—that some practical things could be done to reduce stream pollution from mine drainage.

And it might be recalled that during the 1930s, the U. S. Public Health Service directed a small program of sealing of abandoned mines (ENR Jan. 9, 1936, vol. p. 42). These seals, designed to cut off air while permitting drainage, were credited by the PHS with reducing acid.

Federal funds did not provide for maintenance of the seals and ultimately many became ineffective. There is reason to believe that sealing, properly executed, may have more merit than has been credited to it.

If abandoned mines could be flooded to minimize the exposure of sulfurous materials to oxygen, some reduction in acid could be expected. But flooding is not always possible. Some mines are located above groundwater level and thus cannot be kept full of water. Others, especially old drift mines, have such a shallow cover, with fractures and crevices, that they are not susceptible to flooding and sealing.

Another practice for reducing stream pollution from acid mine-drainage is to minimize the contact time between the water and sulfurous materials. The obvious answer to this is to promote rapid and continuous drainage removal.

One of the practical measures set forth in the Orsanco controls calls for the regulation of discharge from mines in a manner to equalize the flow over a 24-hour period. This principle of "dribbling" stemmed from experiences of L. S. Morgan, chief of mine-drainage control for the Pennsylvania Health Department, who has played a major role in advising Orsanco.

Over the years Mr. Morgan discovered that many mines—taking advantage of lower off-peak power charges—operated their discharge pumps only for a few hours after midnight. This resulted in the "slugging" of streams with heavy acid concentrations once or twice a day. "If we can stop the slugs," points out Mr. Morgan, "either by continuous pumping or by using a lagoon from which to bleed off acid waters at a constant rate, then the stream has some opportunity to neutralize the acid, at least to the point where aquatic life might be preserved."

In developing the control measure, Orsanco had the benefit of review and appraisal by its Coal Industry Advisory Committee, which represents a cross-section of the mining operators in the region. The many discussions between the "regulated" and the "regulators" achieved ultimate unanimity of viewpoints. In a message to coal-industry executives following adoption of the measure, R. L. Ireland, chairman of the executive committee of the giant Consolidation Coal Co., and vice-chairman of the National Coal Association, put it this way.

"The Ohio River Valley Water Sanitation Commission has the obligation under law to ameliorate and, where practicable, to abate stream pollution. Its attitude toward the coal industry is: 'We would rather accomplish our mandate through cooperation than through compulsion.' Let's not force Orsanco to change its attitude."

Orsanco's Acid Mine-Drainage Measures

- Surface waters and ground waters shall be diverted where practicable to prevent the entry or reduce the flow of waters into and through [mine] workings. Water that does gain entry to the workings shall be handled in a manner which will minimize the formation and discharge of acid mine-drainage to streams.
- Refuse from the mining and processing of coal shall be handled and disposed of in a manner which will minimize discharge of acid mine-drainage therefrom to streams.
- Discharge of acid mine-drainage to streams shall be regulated insofar as practicable to equalize the flow of daily accumulations over a 24-hr. period.
- Upon discontinuance of operations of any mine all practicable mine-closing measures, consistent with safety requirements, shall be employed to minimize the formation and discharge of acid mine-drainage.
- Under appropriate circumstances, consideration shall be given to the treatment of acid mine-drainage by chemical or other means in order to mitigate its pollutional properties.
- Nothing stated in these control measures shall be construed to relieve any municipality, corporation, person or other entity from responsibility for compliance with existing federal, state and local laws and regulations.

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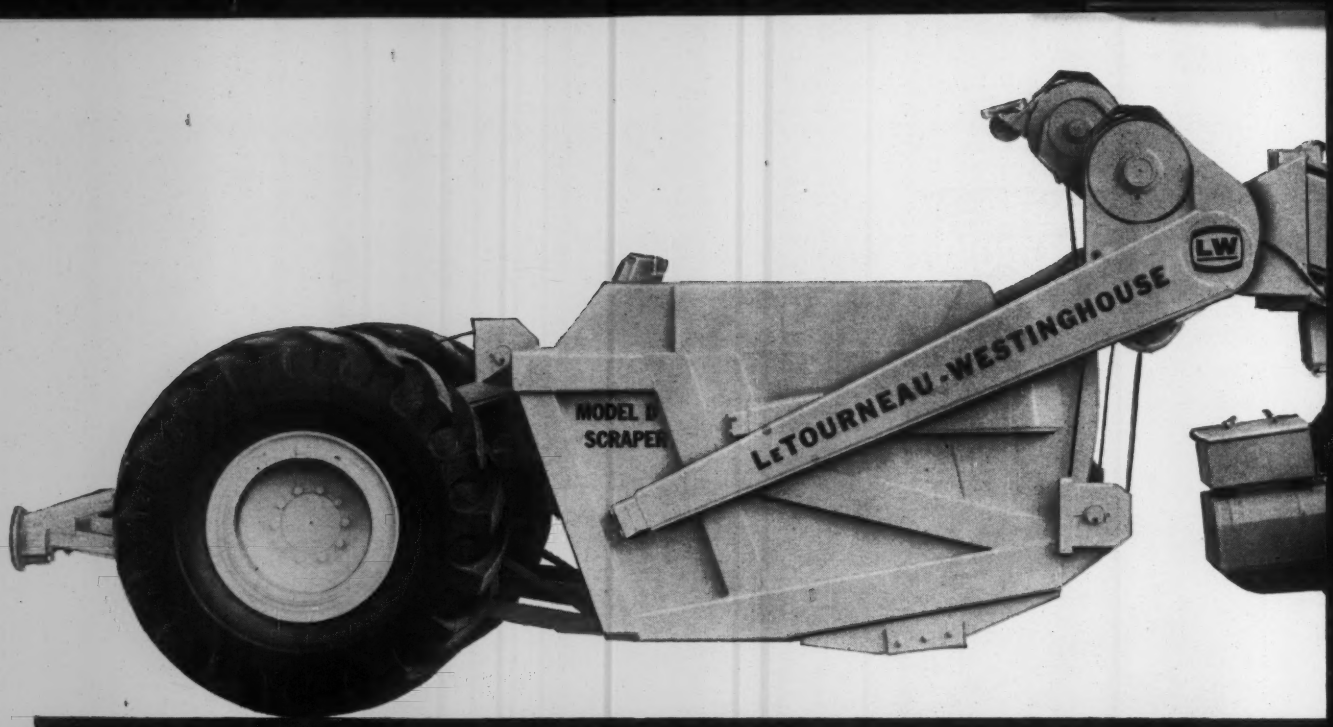

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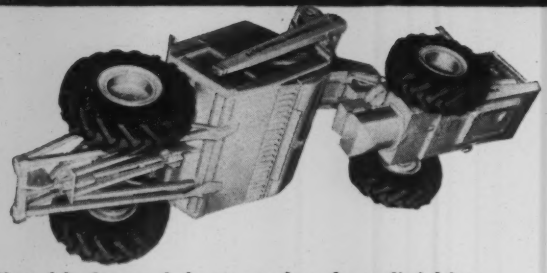

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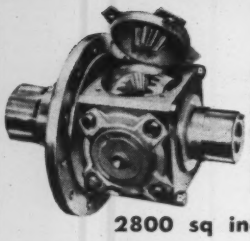
D 'Pull's flat, straight-edged blade and smooth, flat bowl-bottom let you establish grades that are remarkably close and accurate. Some scrapers in this range offer curved or rounded blades and bottoms which make them completely unsuitable for finish-work.



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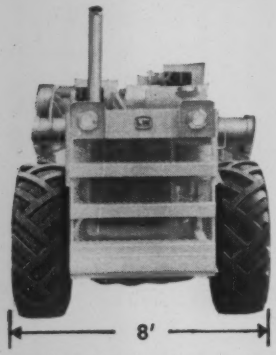

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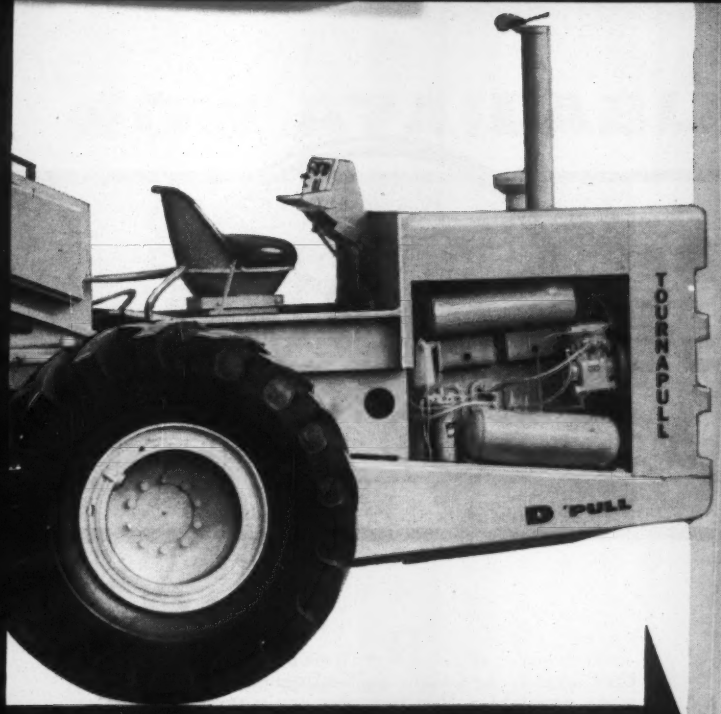
A	52,500	155	339:1
C	58,500	143	409:1
E	47,500	148	321:1
I	81,500	172	474:1
M	54,000	162	333:1



has no competition"

Here's a direct quote from a contractor† who's one of the country's ten largest

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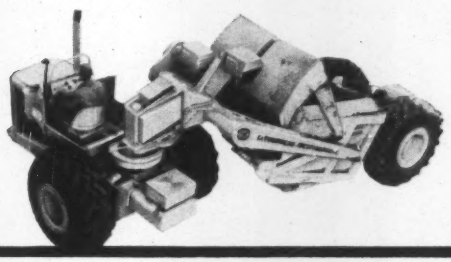
†Name on request.

Most maneuverable scraper of all

D 'Pull U-turns in 24'3"-wide area. No other scraper can *touch* that maneuverability. You benefit on every cycle, because "D" can work closer to edges of new highway slabs, position faster, get into fill more easily, and avoid long, slow back-ups.



Plus all of these Cost-Cutting "Best of Its Class" Advantages

CHOICE OF TRANSMISSIONS . . . step-gear or power-shift with torque-converter (only scraper in this range to offer you this choice); LOWEST LIST PRICE . . . HIGHEST TRADE-IN VALUE . . . ELECTRIC CONTROLS for fast response, easiest operation, lowest maintenance costs, and complete *weather-proof* availability . . . INTERCHANGEABLE TRAIL UNITS: remove scraper and use 11-ton Rear-Dump, Flat-Bed, Side-Dump, or Crane behind D 'Pull prime-mover.

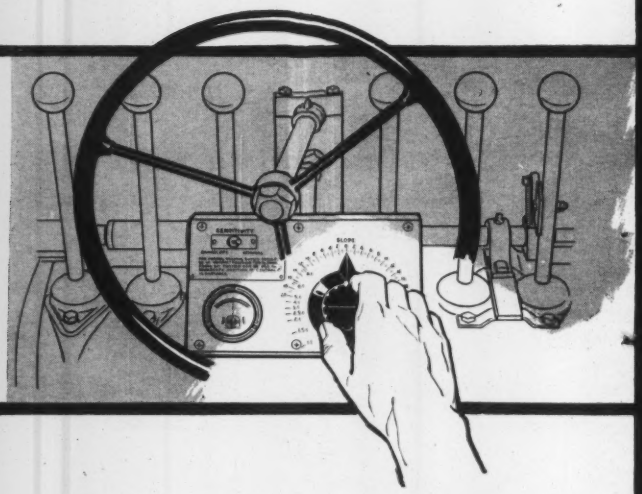
Your LW Distributor has copies for you and your equipment supervisors of this new 16-page summary of D Tournapull features. It gives you the background facts of *why* the "D" is a money-maker on any-size job. Better yet, talk to your LW Distributor about a demonstration of the D 'Pull as a finish and cleanup tool, on any job you're now handling. He'll arrange all details at no cost or trouble to you.

*Trademark DP-2298-DC-2

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit



Here's an important attachment that makes LeTourneau-Westinghouse graders *still* more profitable. You can now equip your LW grader with the Preco "all-transistor" automatic blade-control. This attachment makes it possible to *automatically* maintain desired cross-slopes while grading.

Accurate grade in 50% less time

Your operator sets the Preco "dial" for any desired slope and puts either end of the blade (usually the

You can use the Preco control profitably for every grading job from the roughest to finest. By doing *automatically* the important job of maintaining the desired transverse slope, it makes the operator's job easier — permits him to work faster, more accurately *for you!*

Check these other recently-announced LW grader attachments

ATECO Ripper — This mainframe-mounted ripper breaks up heavy and tough materials fast. Operator has complete and accurate control . . . ripper operates through the grader's hydraulic system. Available with several different shank shapes, for various jobs, and can be mounted to "660" or "550" graders in the field, or purchased as optional equipment with new graders.

Jebloader and Jebco Elegrader — These LW grader attachments plow and cast material up to 1750 cu yd per hour. Load into trucks at up to 800 cu yd per hour. LW graders can also be used as the main unit in the new Jebco Seal-Coater.

You also profit by these proven LW quality features

- 12-speed transmissions (8 forward, 4 reverse), plus 3 optional creepers, give you more full-power gear ratios. POWER-*Flow*® models (145 and 190 hp) have torque converter, infinite gear ratios, with speeds to 27.4 mph.
- Big blade-circle . . . 63" diameter for steady blade control.
- Full-sweep visibility . . . operator can see all critical areas of blade, plus road ahead . . . sitting or standing. He also has "handy-reach" power-controls.
- Quick, easy moldboard tilt-adjustment . . . operator can change blade-pitch in minutes.
- Super-strong one-piece frame, for rigid support, trouble-free performance.
- Full-floating drive-axle and anti-friction power train, for less wear, less maintenance.
- Welded bar-and-plate front axle (the strongest built!).
- Rubber-mounted engine, to minimize vibration.

There's a size LW grader to fit your every need, 85 to 190 hp. We will give you complete facts and a demonstration.

NOW AVAILABLE...

PRECO automatic blade-control for LW graders

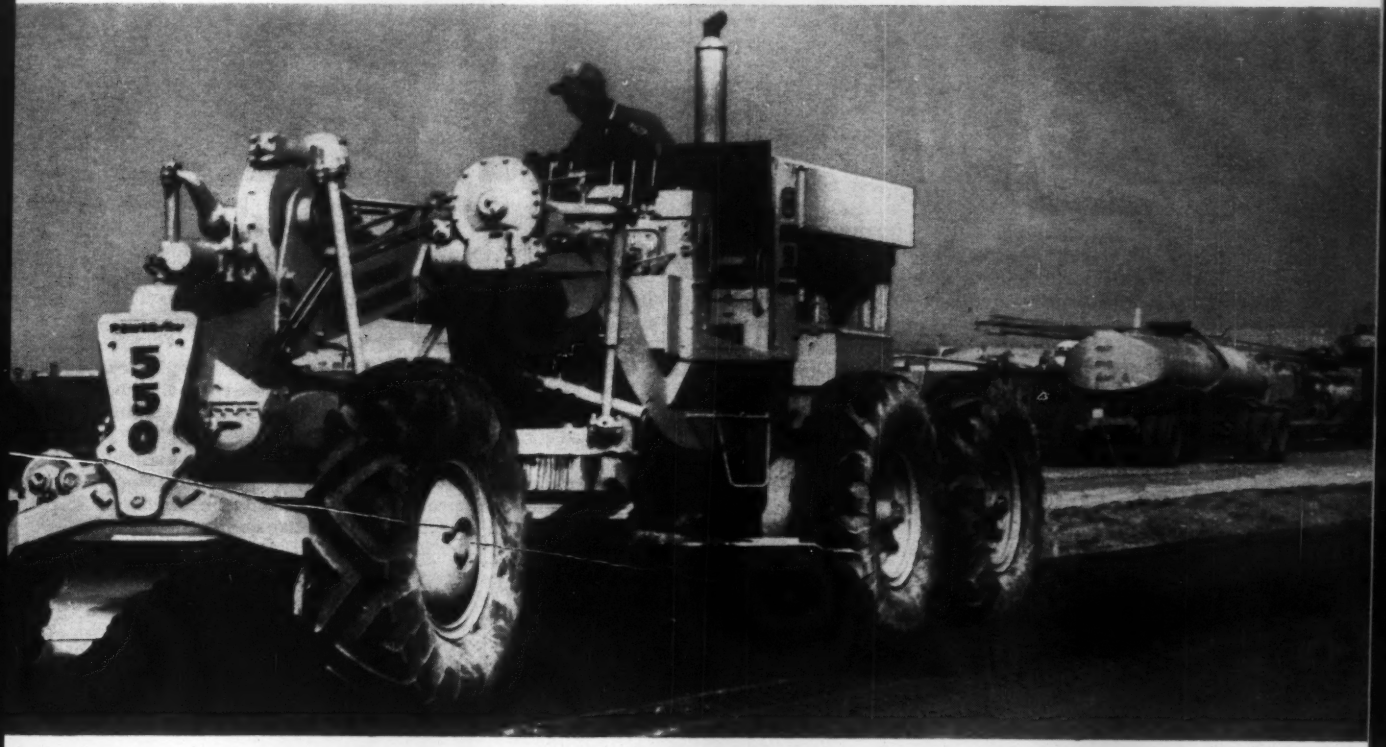
heel) under automatic control. He is then free to concentrate on his reference line . . . forgetting about the automatic end of the blade, because it will *always* be at the right spot and the right slope. Result: he gives you a finished grade in up to *50% less time!*

Use of the Preco blade control on your LW grader also cuts construction costs. Intermediate grade stakes, for instance, can be eliminated or reduced, where state practice permits. Labor costs for auxiliary help, such as grade-checkers, are reduced. You also save material by insuring a smoother and more accurate finished surface.

Installed easily and quickly

This automatic blade control can be installed easily in a few hours on any new or used LW grader. Extensive performance tests prove that the control is *far more efficient on LW graders* than on any other machine. The unit never interferes with any normal grader operation.

G-2291-DC-2



LW

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

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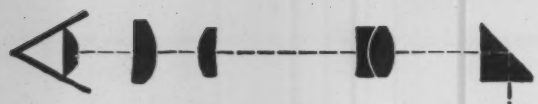
Where quality is a habit



Two Gurley transits feature built-in optical plummets

Gurley OP-57

Gurley OP-137

The Gurley Optical Plummet Transit (Model OP-57) has proved itself to be such an important time and money saver in the field that this optical plummet feature has also been added to the Model 132 Standard Precise Transit. The new transit will be known as the OP-137.

Both these Optical Plummet Transits will save you time and trouble in setting over a point. The OP-57 and OP-137 eliminate the swing and sway of the cord and plummet—exasperating and time consuming. You will especially appreciate the increased accuracy on windy locations.

By rotating the instrument 180°, you can be assured of positive centering.

The Gurley Optical Plummet Transits are furnished with tripods which have built-in shifting heads. They allow a two-inch shift of instrument over the point, providing greater latitude in initial set-up.

Model OP-57 is recommended for very exacting work; the OP-137 for general engineering and construction work because of its shorter telescope, smaller size and its lighter weight.

Now in *two* models Gurley offers you an important advantage of the optical-reading theodolite *plus* the simplicity, ruggedness and proved performance of the American transit. *Write for new Bulletin OP-100.*

GURLEY

W. & L. E. Gurley

Engineering Instruments Division

Union Plaza **Troy, New York**

Sound Waves Map Michigan Soils

- **Highway department crews use miniature seismograph to locate and define subsurface soil and rock layers.**
- **Survey results are used to classify excavation, locate bedrock and the water table, and plan excavation methods.**
- **Here's how the method pays off for designers and constructors:**

Simple seismic tests are helping the soils section of the Michigan State Highway Department provide more and better highway design information on a routine basis.

Quantities and classifications of materials to be excavated are available to contractors before bidding; fill materials are located and classified.

The information gained makes possible more accurate and lower bids.

But the benefits of the method do not end when the contract is let. Once construction gets under way, the project engineer has more specific information, and contractors can schedule equipment for excavation more wisely. The job moves faster when depths of bedrock and the water table have been previously determined.

A highly portable, miniature engineering seismograph is used. Its principle: sound or shock waves travel in the earth at a rate dependent upon the density of the materials through which they pass (ENR July 16, 1959, p. 76).

The Michigan State Highway Department has adopted its seismic analysis method for routine sub-surface investigations. Surveys are conducted by a seismic team under the direction of the geophysical unit of the soils section.

Surveys are requested by design engineers, soils engineers and other divisions within the Highway Department. Results of surveys, including profiles, are distributed to those requesting information, district soils engineers, project engineers and their construction supervisors.

Reports are also made available to contractors before bidding and for use in planning excavations and scheduling equipment.

The most frequent request is for subsurface information on deeper cut sections. Here, the first problem usually is locating bedrock. A few soundings, each taking about 30 minutes, are enough to establish the presence or absence of bedrock to proposed cut depth. If rock is present, its depth below the surface is determined.

When soft bedrock overlies hard bedrock of the same composition, a seismic discontinuity can be detected between the two layers. By relating the velocities to those of materials with known excavating characteristics and to boring information, the department has been able to classify excavation in such cases prior to bidding.

Materials are usually of two types: those that can be excavated with heavy tractors with rippers and scrapers; and those that will probably require drilling and blasting before removal.

Seismic discontinuities also show layers of sand, clay and loam. This information is of particular value to design and soils engineers in specifying base and sub-base materials and thicknesses.

The MD-1 engineering seismograph used by the department is manufactured by Geophysical Specialties, Inc., Hopkins, Minn. It is light and portable. Surveys can be completed without extensive clearing or access-road construction. Readings are positive and direct. No special training is required to use of the instrument. Depth calculations are accurate to $\pm$ 5%.

If soundings are taken at 50-ft intervals, which is a very detailed survey, three or four days are required to survey a ½-mile cut. But, usually, fewer soundings are required.

Seismic analysis is useful in overcoming the limitations of other methods. Since depth information is given over the distance covered by the traverse (a series of soundings taken at 10-ft intervals from the geophone), results are not limited to one point, as in the use of borings. Borings or sounding rods may be limited by the presence of impenetrable layers.

Boulders in drift do not greatly affect depth information given by the seismic method, but they may lead to inaccuracies when probing methods are used. On jobs where borings are used to verify seismic results and give exact soil information, only a few are required. The combination of borings and seismic readings gives a quicker and more accurate picture of sub-surface conditions than would borings alone.

The department's work with seismic analysis falls into three categories: surveys that provide definite answers to definite problems; experimental applications; and those surveys that fall between.

Definite answers to definite problems are given when requested by soils, design, or project engineers for a specific job.

Typical of the Michigan's most frequent type of request for sub-surface information was one for locating and outlining bedrock on a cut for relocation of US-127 in Jackson County.

From known geology of the area, bedrock was suspected within the depth of the proposed cut, which averaged 15 ft.

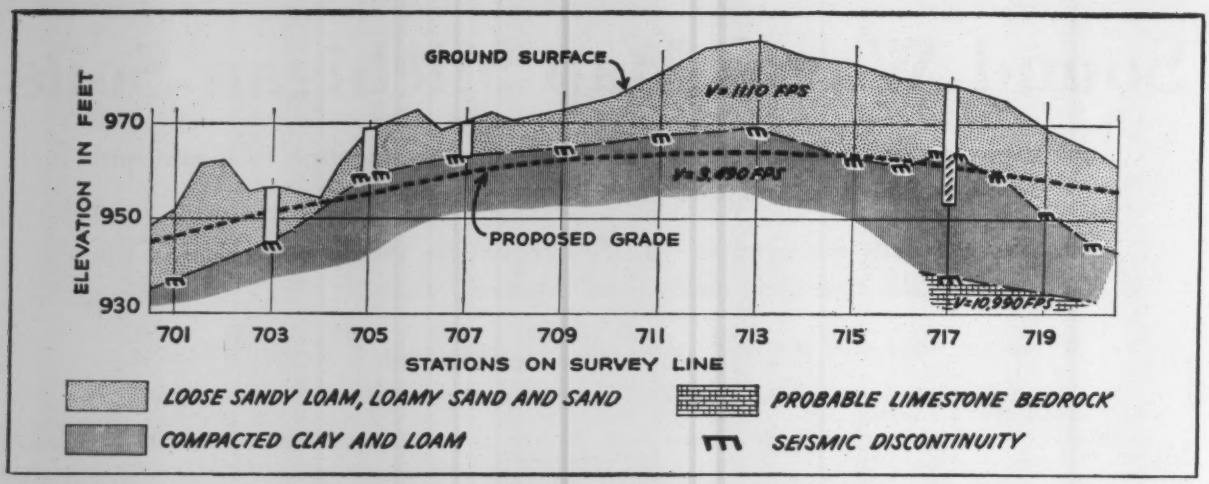
Seismic soundings, run along the 1900-ft cut, found three things: Bedrock existed at one end only and well below grade line; there was a body of compacted clay and loam slightly above grade at the center of the cut; the depth of the loose sandy loam topsoil was established.

The profile constructed from this information (No. 1, on p. 70) was given to design engineers for use in designing sub-base and fixing the grade. It was also made available to contractors bidding on the job.

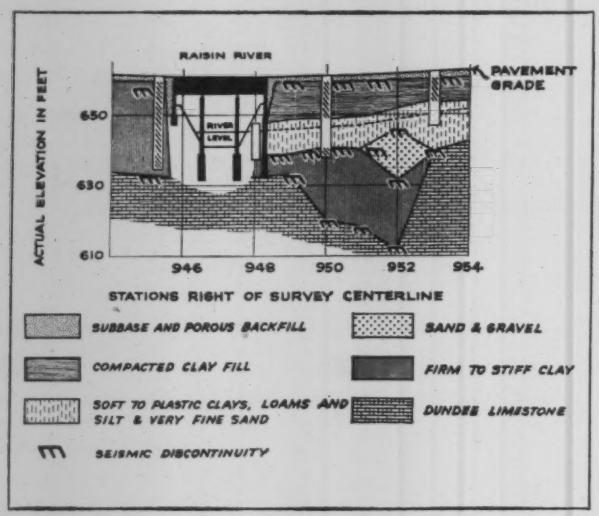
Four test borings made at various points along the profile correlated seismic findings and aided in material classification. Seismic velocities of the materials found at boring points where soils were sampled were compared with velocities found elsewhere to establish the type of material along the entire length of the cut. The presence of scattered boulders would have made it difficult to use borings to establish bedrock depth.

Results from another seismic survey show how pre-bid classification of materials to be excavated is provided when a quantity of bedrock is found above the proposed grade line. The proposed grade was for a relocation of the Kalamazoo River near Battle Creek.

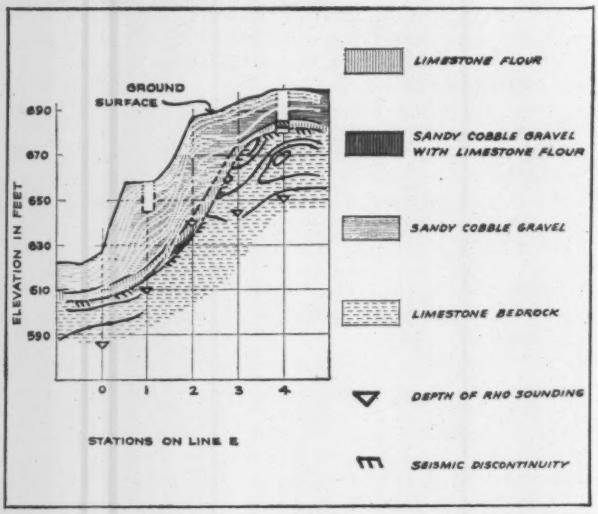
Seismic analysis found a velocity change at two levels (see 2, p. 70). The overburden ranged in depth from 15 ft to less than 1 ft. The next layer, soft



1. Request for information on location of bedrock in cut section resulted in this profile along relocated US 127.



3. At this location, borings met refusal before reaching bedrock.



4. Borrow materials were located by a series of profiles like this.

and weathered sandstone, showed seismic velocities of 1,700-3,800 ft per second.

Rippability tables developed by the Caterpillar Tractor Co. (ENR Dec. 10, 1959, p. 43) show weathered sandstone with seismic velocities up to 6,000 ft per second to be rippable by heavy equipment. This soft and weathered layer would be considerably cheaper to excavate than the underlying layer, which was hard sandstone bedrock with seismic velocities of 6,600-13,000 ft per second. Sandstone with seismic velocities such as these would probably have to be drilled and blasted for removal.

The time required to perform the necessary seismic soundings in such a case is less than that required for even scattered borings, and the cost is far less.

Using the profile shown as No. 2 (made 50 ft to the right of centerline) and another made on the centerline, contractors could also determine approximate volumes of materials in each classification.

Though unusual, another application demonstrates the very complete sub-surface profile information that can be obtained. Porous backfill for a new bridge on relocated US-23 was sliding past the piles forming the bridge abutments and threatening to undermine the approach grade. It was suspected that materials immediately adjacent might be sufficiently unstable to cause a dangerous shift under continuing heavy loads.

Borings established the materials in the top several layers but met refusal from boulders before establishing bedrock. The third profile shown was constructed from a subsequent seismic analysis.

Analysis proved the stability of the sub-surface structure, and measures were taken to contain the backfill around the pilings.

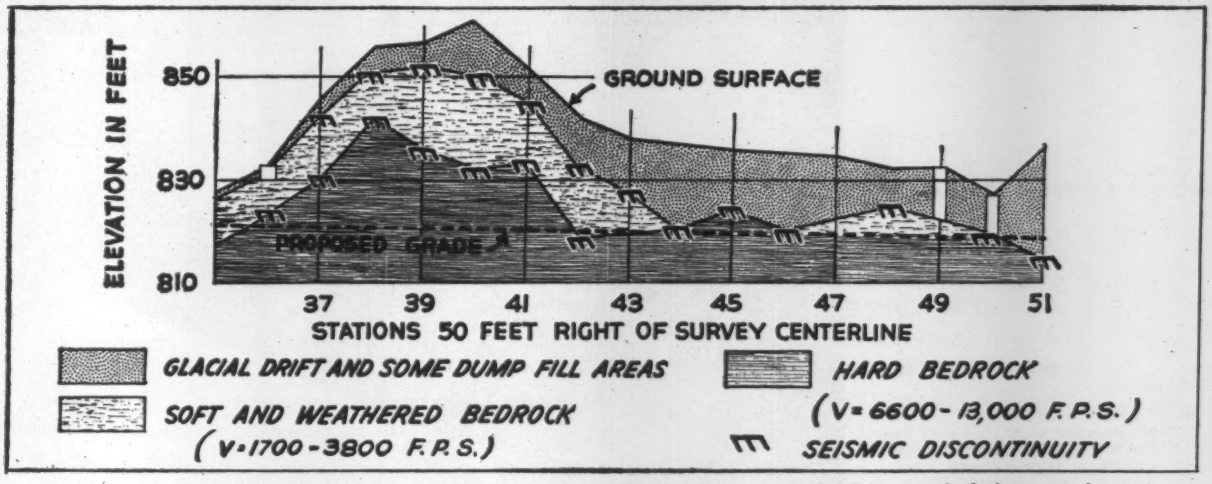
Locating suitable borrow and aggregate sources is often a problem before bidding and during construction. Explorations performed by the Testing Laboratory Division show seismic analysis with the MD-1 to be one simple, fast and highly effective method of locating and outlining such deposits.

It is particularly effective in establishing depth of overburden and quantity of deposit of a particular type. By comparing velocities found in a given deposit with those found in other known deposits in the area, valuable information about the nature of the deposit is obtained.

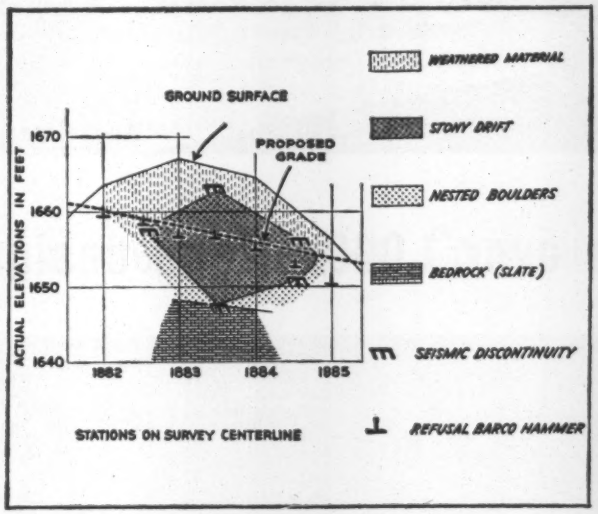
A few test borings and samples produce even more exact information, when required.

No. 4, above, shows the seismic profile constructed for a highway department borrow pit. A slope and thick undergrowth presented difficult access problems. But a sub-surface survey was necessary because the contractor was doubtful that a sufficient deposit of suitable borrow existed.

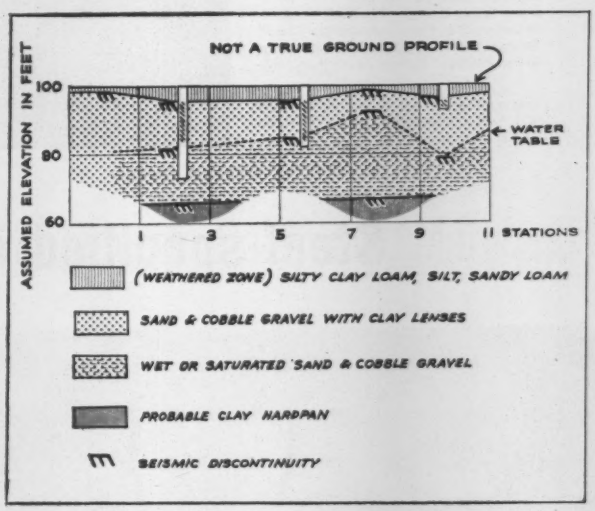
The seismic method established the



2. Seismic method defined boundaries of soft and hard rock layers. The two layers required different methods for removal.



5. Soundings met refusal here before reaching bedrock.



6. Seismic method accurately located water table in this case.

presence of bedrock and outlined the depth of the drift material. A series of such profiles, run across the slope, determined the actual quantity of material and proved sufficient for the needs at this point. Other exploration methods, used as a check, proved inadequate for providing quantity information.

The wavy contour lines shown in No. 4 were developed by the resistivity method, which is based on measurement of the electrical resistance of soil materials. The resistivity method provided accurate information about the nature of materials in drift, but did not give the depth to bedrock because the overlying drift and bedrock yielded similar resistivity values. Bedrock and overlying drift had the same electrical properties but vastly different elastic properties, as demonstrated by seismic analysis.

One of the more difficult areas in which to get accurate sub-surface information is Michigan's Upper Peninsula. Presence of glacial drift with high boulder content frustrates drilling and sounding attempts; and rough terrain overgrown with thick underbrush makes surveys difficult.

Traditionally, bedrock has been located by driving sounding rods with gasoline hammers. It is slow, laborious work and the results are sometimes erratic.

No. 5 above is a typical profile made in Baraga County after a few hours of seismic work performed by a two-man crew.

Bedrock is located and shown well below the proposed grade line. Other materials in the cut have been located and identified. The symbols indicating sounding rod refusal depths clearly show the misleading information derived from this method. Refusal points indicate bedrock at a line close to the grade line.

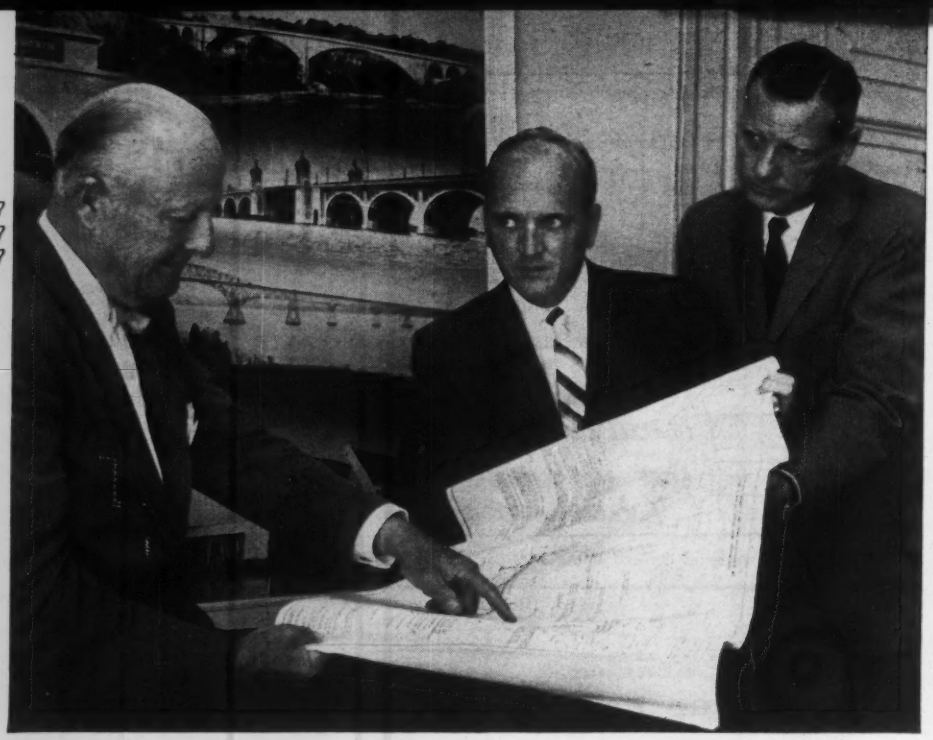
Knowledge gained from seismic analysis is often especially valuable in planning construction. Knowing the location of the water table shown in the profile of a proposed highway borrow pit, see No. 6, the contractor will be able to provide the necessary drain ditches or equipment to prevent a construction slow-down.

Locating water tables is also vital in providing adequate drainage when designing roadway.

Applications still in the test stage promise even wider benefits. Studies under way show a high correlation between seismic discontinuities and undisturbed sample tests. Such studies may indicate a useful application of seismic analysis to soil stability and density determinations or correlations.

The geophysical unit of the soils section of the Michigan State Highway Department is headed by Donald F. Malott. Head of the Soils Section is G. O. Kerkhoff. These operations are under the Director of the Testing Laboratory Division, C. J. Olsen. The Office of Testing and Research is headed by Testing and Research Engineer, W. W. McLaughlin.

Keep our roads on the GO



Mr. Herschel H. Allen, Senior Partner of the J. E. Greiner Company, Edward J. Donnelly, and John J. Jenkins, Jr., partners. Some of their outstanding bridges that won coveted awards include the Delaware River Bridge, Trenton, N. J. to Morrisville, Pa.; Cuyahoga River Bridge, Ohio Turnpike; Susquehanna River Bridge, Havre de Grace, Md.

Interchange of U. S. routes 50 and 301 with Maryland route 2 near Annapolis, Maryland.

Steel specified in over 1,000 bridge designs

Since 1908, when the J. E. Greiner Company was founded, the firm has designed more than 100 large steel bridges and designed and supervised the design of about 900 short-span steel bridges for major turnpikes and expressways. According to Mr. Allen, Senior Partner, steel has always played an important part in their designs because of its economy, speed of erection and easy handling.

In recent years, the Greiner Company has designed a large number of short-span steel bridges for various sections of the Pennsylvania Turnpike, the Ohio Turnpike and the Indiana Toll Road. Speed of construction was important on all these projects and virtually every bridge design developed by the company utilizes steel construction.

Steel saves engineering time and construction time. Its stress and endurance factors are well-known. Contractors know how to handle it . . . and USS offers a full range of grades as well as a full range of sizes, permitting the most economical design in any situation.

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TUBELESS OR TUBED

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*Firestone T.M.

Swiss Cable Line Spans 3,300 Feet

The recently completed passenger cableway across the Lake of Zurich, Switzerland, has the longest cable span of its type in the world—more than 3,300 ft. Engineers used the principles of the suspension bridge in its design.

Total length of the cableway is 4,560 ft; between entrances to the terminal stations the distance is 4,440 ft. Each of the suspension towers is 180 ft high.

Four steel strands make up each of the twin suspension cables, which pass over the tops of the towers. Designers incorporated a factor of safety of 2.5 (ratio of breaking load to operating tensile load) for the cables.

The transport cable, on which the passenger cabins are fixed, is attached to the suspension cables at four points equally spaced between the towers. At the towers, the transport cable passes over rollers located about six-tenths the way up the tower (116 ft above the ground).

Highest point on the transport cable —at the first point of attachment to the suspension cable—is 126 ft above the level of the lake. At the lowest point in the crossing, the bottom of a passenger cabin is 66 ft above the lake.

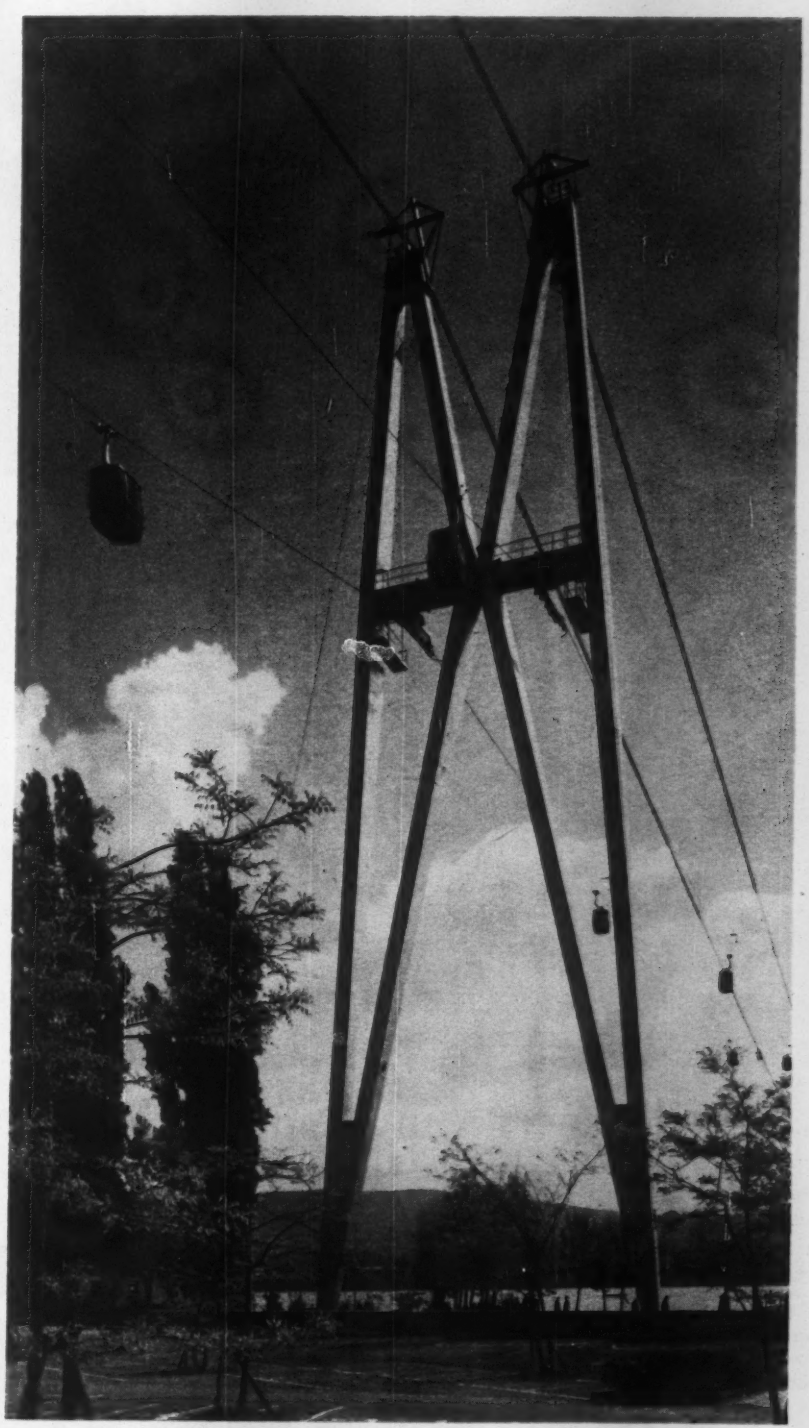
Brackets hold the four strands of each suspension cable together at intervals one-third of the way between transport and suspension cable tie points. Designers found this to be necessary to prevent oscillations in the separate strands under wind action.

There are 52 cabins in all—26 on the "go" section and 26 on the "return" section. Spacing between cabins is 222 ft and travel speed is about 10 ft per sec. Each cabin can hold four persons.

When a cabin leaves the terminal, it is accelerated by a short downward slope before running on to the transport cable. At the other end, the cabin runs off the transport cable, is braked by an upward slope, and then runs on to a slowly moving transport chain. The cabin is continuously in motion, but speed of the transport chain is chosen so there is no danger to persons getting in or out of it. Speed of the chain also controls the minimum spacing of cabins along the transport cable.

Tower bases rest on spherical surfaces (pin connections). Each tower is made up of steel box girders welded and bolted together, using high-strength bolts. These fabricated steel box girders in each tower weigh 90 tons.

(*Turn the page*)



BOX GIRDER TOWERS support a passenger cableway across the Lake of Zurich.

Use of the single-cable suspension system led to substantial cost savings. In order to achieve the same relative earning capacity, a two-cable system would have had to transport about 1,000 persons per hour, in comparison with the 670-person per hour capacity of the single cable.

Maschinenfabrik Habegger of Thun, Switzerland, developed the cableway system. Max Walt, Zurich consulting engineer, designed the towers.

. . . And Power Lines Span a Mile

Two giant steel towers, spaced more than a mile apart, will suspend overhead cables high above the Bay of Cadiz, supplying badly needed electrical power to the expanding seaport of Cadiz.

Spanish engineers studied several alternative plans before deciding on the tower scheme for conveying power to the port. Cadiz is located at the tip of a peninsula extending seven miles from the Spanish mainland. At some places the peninsula is only 100 ft wide.

Lack of space, marshy land, and the presence of salt mines prompted rejection of an overland route for the power line. Another possibility was a submarine cable across the bay. Anchorage problems resulting from the unstable, muddy bottom and the strong currents led to the rejection of this scheme in favor of the towers.

Shafts of the 480-ft-high towers contain two truncated pyramids, one inside the other. Spaced 29½ in. apart, they are laced together with lattice trusses in vertical and horizontal planes. Every surface plane is braced with oblique members forming a diamond-shaped parallelogram.

Tower cross arms, bearing on trussed cradles at the tower tops, cantilever 115 ft from the shafts on each side. Like the towers, the cross arms are pyramids. Each plane of their diamond-shaped cross sections contains a Viereendeel truss.

Located at the entrance to the bay, the cables span 5,377 ft across the straits. They are anchored more than 1,300 ft from the base of each tower. These great anchorage distances were chosen for two reasons: to lighten the vertical component of the cable force on the tower; to anchor the cables in foundations in good soil.

Tower foundations are reinforced, prestressed concrete rings of hollow triangular cross section. They bear on two concentric circles of 25-in.-dia piles driven 50 ft through sand to a sandstone stratum.

The multi-legged tower and its annular foundation provide for more uniform distribution of pile bearing loads than a conventional tower with four legs and a monolithic pile cap. Wind loading would produce excessive local load concentration on the piles with a conventional design. The two concentric rings of piles connected by the rigid annular ring more evenly distribute the pile bearing loads.

A centrally located derrick with two booms erected each tower. Standardization of structural steel sizes accelerated erection speed as workers became familiar with the work. Members range in size from angles 1¾ x 1¾ x 5/16 in. to 5 x 5 x ½ in. and plates from ¼ to 1 in. thick. The steel fabricator welded them into erection units and dip-galvanized them before shipping to the jobsite.

Use of a large number of small structural members instead of a smaller number of large members also reduces failure risks. Failure of a single member would be relatively unimportant, and replacement would be quite easy.

Properties of the Spanish structural steel are somewhat different from standard American ASTM Designation A7 structural steel. Though it has a higher yield point (48,000 psi vs. 33,000 for A7 steel) the Spanish steel has an ultimate strength of 60,000 psi, the minimum permitted for A7 steel.

The towers are designed for a rather conservative load factor of 3.75, based on ultimate strength (or 3.0 based on yield strength) for the following load conditions:

- Dead load + transverse wind
- Dead load + longitudinal wind

(*Story continues on p. 78*)

Will your bond-financed sewer system serve for generation after generation, far beyond the date the last bond is paid? Or will it have to be replaced before the bonds are retired.

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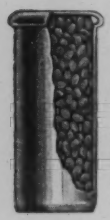
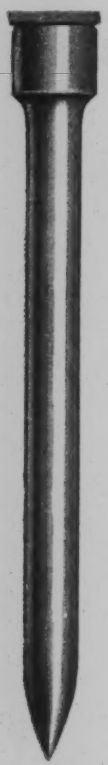
Here's why any powder-actuated tool works better with Remington Loads and Studs



Exclusive "Kleanbore" Priming

22 caliber Power Load (twice actual size)

Scientifically graded Remington Power Loads offer precise, uniform charges . . . have strong, non-rusting brass cases. Exclusive "Kleanbore" priming mixture protects bore of tool because it does not cause rust or corrosion. No need to clean barrel after every job! These quality Power Loads are subjected to multiple inspection during manufacture, are backed by Remington—a name well known to American sportsmen. No matter what powder-actuated tool you use, it will work *better* with Remington Power Loads!



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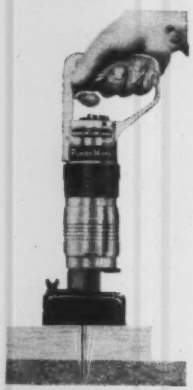
¼" S-25 Stud (twice actual size)

Uniform performance and penetration are assured with precision-made ¼" and ⅜" diameter Remington Studs. These high-strength studs are made with special molybdenum steel. Specify Remington Studs with exclusive green "Power-Guide" heads . . . for uniform performance and straight-driving penetration. Over 60 "job-rated" Studs to choose from—your assurance of a Remington "Power-Guide" Stud to fit every fastening application.

Remington know-how insures the quality of its Studs and Power Loads. No other company can offer the background of experience gained through the manufacture of billions of these units. When you order studs and loads, you'll get better performance if you specify Remington—maker of the most versatile fastening tool ever designed (right). We'll gladly send valuable free booklets about Remington Power Loads, Studs and fastening tools. Mail the coupon today!



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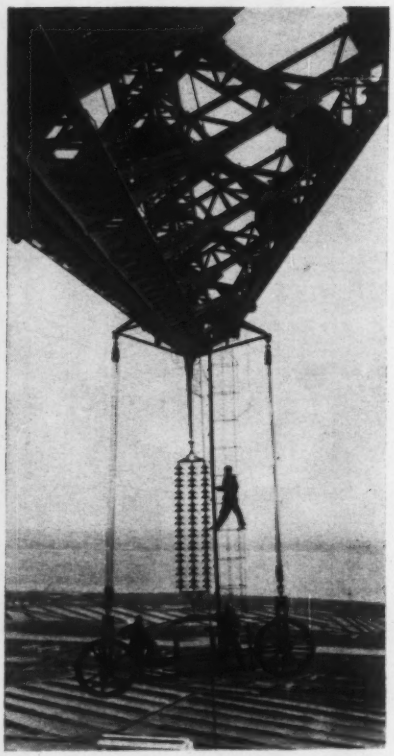

WORKMEN ON 'BICYCLE' set cables in saddles on tower cross arm.

Wind was assumed at 80 mph, producing 25 psf pressure on flat surfaces, 15 psf on projected cylindrical surfaces.

The designers also analyzed the towers for the foregoing loadings combined with the dynamic force produced by accidental fracture of one of the six cables. For this improbable combination of loads he reduced the load factor to 3.0.

Load factors for tower overturning were 2.25 for dead load + wind, 1.88 for dead load + wind + the load resulting from cable fracture.

Each of the six conductor cables has a structural core composed of 37 steel wires, .087 in. dia. Ultimate tensile strength of the structural cable is 149 kips at a stress of 240,000 psi. The conducting sheath, consisting of 49 aluminum wires of similar small size, surrounds the steel cable core.

The project was an international undertaking. Spanish engineer Alberto Toscano adapted a design by Italian engineer Ghino Covre to suit Spanish steel sections and design specifications. The British Aluminum Wire Cable Co., Ltd., furnished the conductors.

General contractor was the Spanish agency, Instituto Nacional de Industria. It awarded contracts for steel fabrication and tower erection to Spanish companies.

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- FIRESAFE
- PERMANENT

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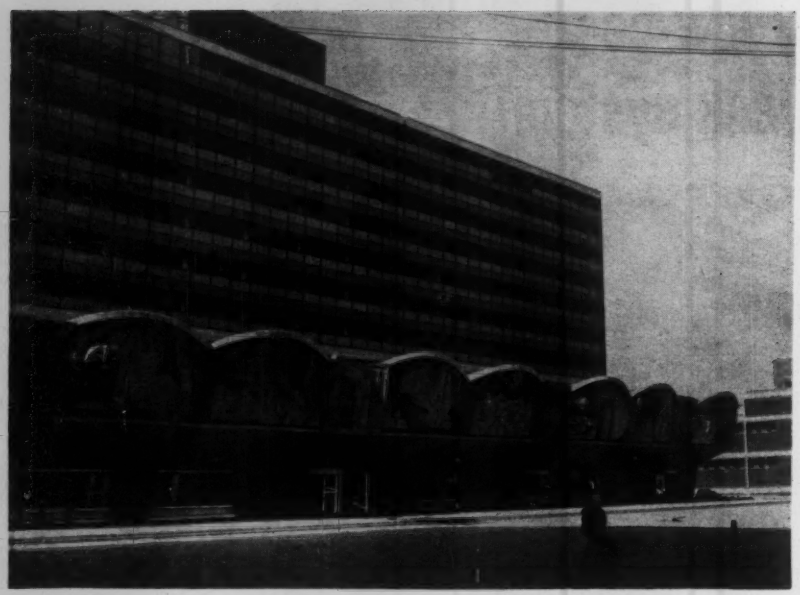


Hospital City Near Completion

Mexico City's giant medical center, under construction since 1953, will be 80% complete by the year's end. Financed by Mexico's national lottery, the $40-million project comprises 26 buildings for transient population of 12,000.

Poor subsoil was the major construction problem. Foundation engineers designed a system of piles driven to an average depth of 165 ft. Final adjustment of pile elevation is accomplished with a system of hydraulic jacks.

Tallest building on the 39-acre site is the 14-story emergency hospital building (see photo). This is a steel-framed structure faced with precast concrete wall panels. All other buildings are framed in reinforced concrete. Exterior walls are generally precast concrete or clay tile. Many walls are decorated with murals and mosaics.

The medical center is a group effort in many respects. Over 100 contractors are building it. There are several structural engineers associated with the design of each building. Architect Jorge L. Medellin is director-general of the project for the Mexican Public Health and Welfare Ministry.

London Tower to Top St. Paul's

London's tallest building, the 34-story headquarters building for Vickers, Ltd., is under construction with completion scheduled for late 1962. Rising 385 ft, the steel-sheathed office tower will top St. Paul's Cathedral by 20 ft.

Authorization of the record height breaks a tradition long sustained by London building officials. They have always been reluctant to approve any building higher than St. Paul's.

Located on the left bank of the Thames River, the office tower is part of a $14-million project which also includes an 11-story apartment-hotel and another office building eight stories high (ENR Apr. 2, 1959, p. 32).

Structural frame of all buildings is reinforced concrete. Most floor framing is of precast, prestressed inverted T-beams; the remainder is two-way cast-in-place joist construction with clay tile fillers.

Exterior wall design for the tower is a rectilinear pattern of mullions and wall panels faced in stainless steel. Wall sheathing for the eight-story building is like the tower's, except for a mosiac-faced spandrel band at each floor. The apartment-hotel has exposed concrete framing with mosiac-faced framing and exposed-aggregate concrete curtain wall panels.

Cast-in-place friction piles, 3 ft in dia, extend 75 ft below basement level into a blue clay stratum. The piles are capped with an 11-ft-thick slab below the tower basement.

Architect is Ronald Ward & Partners; structural engineer, Morgan Travers & Partners; general contractor, John Mowlem & Co., Ltd. All are of London.

World Bank Loans Aid Belgian Congo Transport

The Belgian Congo has just received $33 million in World Bank loans to help finance construction or reconstruction of 2,850 miles of roads and the improvement and expansion of rail and river transport and ocean, river and lake ports.

The Belgian Congo government borrowed $28 million. Much of this amount will go for the modernization of the rail and river network on which the country's transport system is based.

The Congo's road program, for which part of the funds will go, consists of building and rebuilding 420 miles of paved and gravel highways; improvement of 750 miles of roads; bridges and ferries, and construction of 1,680 miles of surfaced, single-lane roads.

Total cost of the road and waterways program is $41.6 million. Completion is scheduled for mid-1962.

The Office of Colonial Transport Development (Otraco) got $5 million from the World Bank. This agency operates the ocean port of Matadi, the port of Leopoldville on the Congo River, the railroad connecting these two cities and extensive river transport.

The bank's loan will help to pay for imports of rolling stock, river craft, port equipment and materials to modernize these installations.

Saskatchewan Power Builds Squaw River Hydro Plant

Work is under way on a $46.2-million hydro development for the Saskatchewan Power Corp. on the Squaw River in the Province of Saskatchewan.

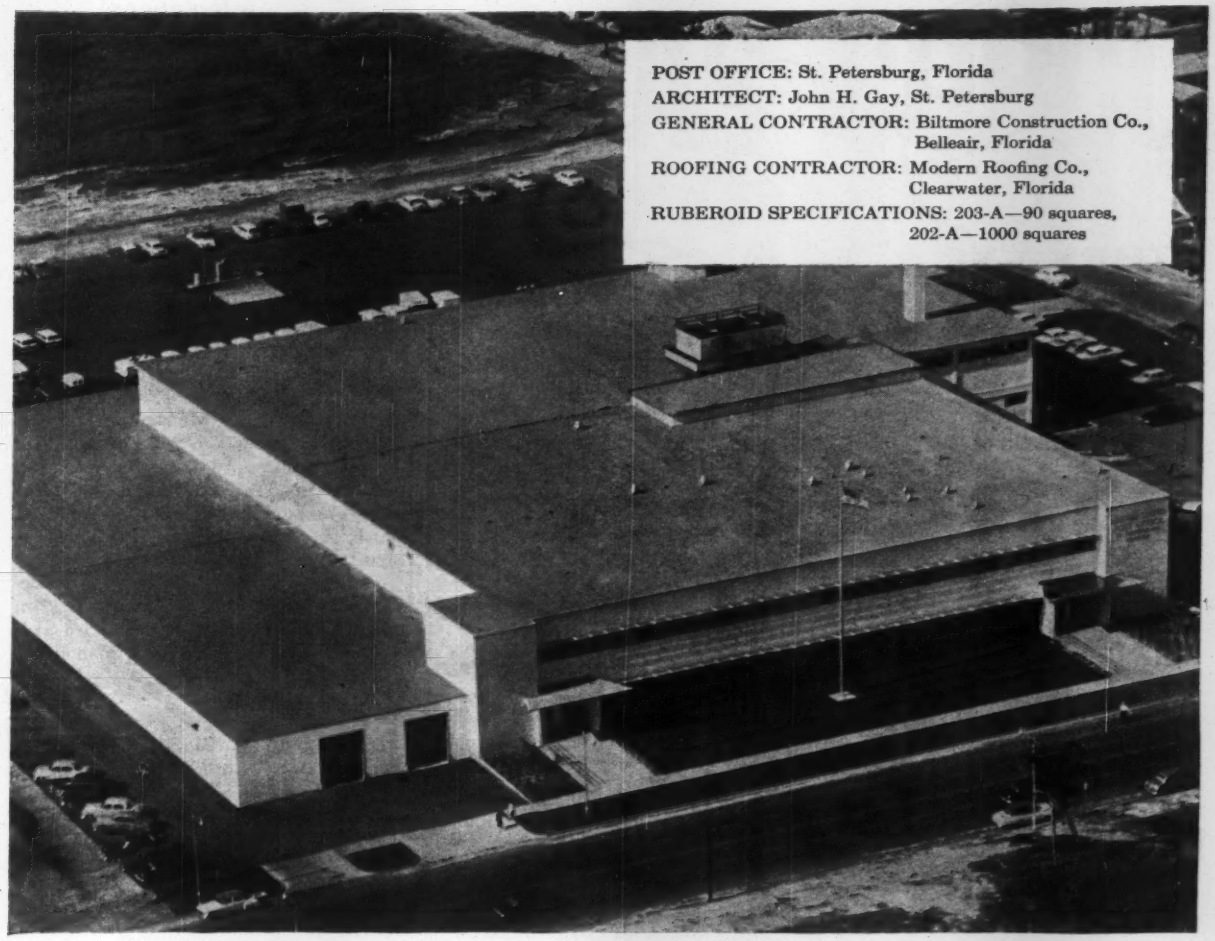
Initial $14.7-million award covers construction of a 110-ft-high earthfill dam, concrete spillway and a power canal. The 2,000-ft-long dam will require 2 million cu yd of fill and 40,000 cu yd of concrete. Dikes require an additional 1 million cu yd of earth fill.

The spillway will be 250 ft wide with five vertical lift gates. An 82x257-ft ice skimming structure will be built adjacent to the spillway.

A three-mile power canal will require excavation of 7 million cu yd of earth, of which 2 million cu yd will be used for canal embankments.

Water will drop 400 ft through 23-ft-dia penstocks from the canal to the power plant at river's edge.

The plant, scheduled for 1962 completion, will have a generating capacity of 201,000 kw. Contractor on this phase of the project is Mannix Co., Ltd., Calgary; consulting engineering firm is Crippen Wright Engineering, Ltd., Vancouver, B. C.



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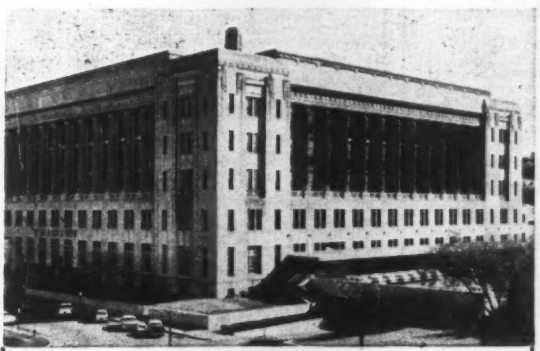

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And Water Seals water stops have more miles of proved performance, too! This record, plus the ease of application and the broad variety of shapes and sizes of Water Seals water stops are all the proof you need of their desirability for your own concrete jobs. If you are after truly water-tight sealing between successive concrete pours, be sure to specify Water Seals water stops. They stand up under high temperatures and heads, even under extremes in shifting and stretching. They are unaffected by acids, alkalies, organic chemicals. Full engineering data and dimension drawings available immediately. Use the coupon.

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Sudan Seeks Loan to Build Water and Power Projects

The Sudanese government is seeking a $47-million loan from the World Bank for major water and power developments.

The projects include the $60-million Roseires Dam on the Blue Nile; the $30-million Khashm el-Girba Dam on the Atbara tributary of the Nile; and the extension of the Managil agricultural scheme.

The Roseires Dam, planned to store 2.4 million acre-ft of water, holds top priority since the Managil agricultural scheme depends on it. The Managil project is necessary to expand irrigation in the rich cotton triangle south of Khartoum. Much preliminary work such as access roads and work camps has been done on the Roseires Dam.

Managil Canal, an 83-mile link between Managil and the Gezira cotton plantations, is being built under a $14-million contract by two German firms. Julius Berger Tiefbau AG and Philipp Holzmann AG.

A new sense of urgency regarding the Khashm el-Girba on the Atbara has come about because of the impending displacement of 50,000 Sudanese farmers at Wadi Halfa, near the Egyptian border, by the backwaters of the High Dam at Aswan. The Sudanese governmen is considering resettling the farmers on lands to be irrigated by Khashm el-Girba.

Thames Barrier Would Block Tidal Floods

Proposals for a half-mile-long tidal flood barrier across the Thames River are before Britain's Parliament. Cost is estimated at between $36 million and $48 million, and construction would take about four and a half years after two years of study.

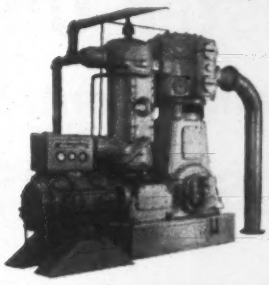
Two alternative types are recommended: First, a $36-$42-million swivel barrier that acts somewhat like a swing bridge; and second, a $42-$48-million lift type that works like a vertical-lift bridge.

The swivel type would have three piers, each about 75 ft wide with two central spans of 480 ft leaving 240-ft side openings. A roadway could be added for a further $17 million.

The lift type would have piers of similar width, supporting the main, 320-ft-high towers. Counter-balanced lift spans would be suspended between the towers. Central openings would give a clear waterway of about 480 ft. Vertical clearance for ships would have to be 175 ft (220 ft for large liners).

Which... ATLAS COPCO COMPRESSOR

meets your needs best?



AR Heavy-Duty Compressors

More air per horsepower than any comparable compressor! For continuous, full-load operation. "L" angle, 2-stage, double acting. Water cooled. Standard models provide 382 to 3210 cfm free-air delivery at 100 psi; only 76-590 hp required! (Can be supplied for other working pressures on request.)

What's your compressor requirement? Need an installation large enough to provide air for all your needs? Or would a small, compact unit for auxiliary operation solve your immediate problem? Either way—and for a wide range of applications between these extremes—Atlas Copco has the compressor for you!

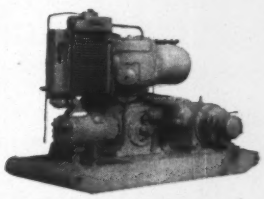
No matter which you choose, you'll get these proven advantages from Atlas Copco:

(1) More air per horsepower—less power consumption than other comparable units!

(2) Really low maintenance (one example—$3.10 after 10,000 hours' operation)!

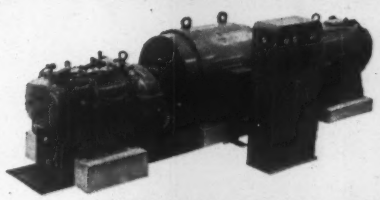
(3) Specifications are guaranteed free-air delivery—you get exactly what you order!

Get all the facts now—and compare! The coupon below will bring you a free catalog. (No obligation, of course.)



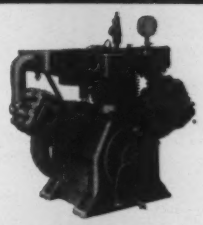
AR-L Heavy-Duty Compressors

Same basic construction as the AR Series, but provided with an air-cooled intercooler and air-cooled radiator for the cylinder water. Fan on compressor flywheel cools radiators. Perfect for arid areas or where difficult to bring in water. Both stationary and skid-mounted models available.



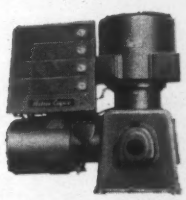
TWIN-AIR Rotary Screw Compressors

Brand new! "Twin-Air" Compressors offer capacities from 6,900 to 19,400 cfm at working pressures up to 115 psi. And, you get completely *oil-free* delivery of air or gas, since no lubrication is required — timing gears maintain small clearances between precision-mounted rotors, eliminating friction (and the necessity of oil) in compression chamber.



CT Air-Cooled Compressors

Stationary, or skid-mounted compressors for use where air demand is between 50 and 300 cfm. Totally air-cooled. Cylinder arrangement designed for smooth, vibration-free operation. Compact, rugged—for continuous, 24-hour trouble-free service. Highly efficient; low on maintenance costs.



ER-6 Heavy-Duty Compressors

New! Fundamental improvements over conventional heavy-duty compressors reduce power requirements (18.3 hp/100 cfm at 100 psi, full load); provide totally enclosed design; and save on floor space. Capacities to 1,140 cfm; standard instruments and safety devices.

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This new Carrier Bypass Induction Weathermaster Unit

with self-contained controls

cuts costs 30%

UP TO NOW Induction-type room terminals for high-velocity air conditioning systems have been automatically controlled by a valve that regulated the flow of water through the coil. The valve and its thermostatic auxiliaries were costly. In addition, it was necessary to select and order the control assembly and the room unit separately. They were installed separately at the job site. All this meant extra design time, extra installation labor, extra installed cost.

NOW Carrier has developed a new 36R Weathermaster* Unit with self-contained automatic control that eliminates the water valve. The new terminal units are delivered to the job site complete, ready for installation. They require no pneumatic or electrical connections. They save design time and installation labor. And they cut installed cost of the unit and its control as much as 30%. For complete details write to Machinery and Systems Division, Carrier Corporation, Syracuse 1, New York. In Canada: Carrier Engineering Ltd., Toronto.

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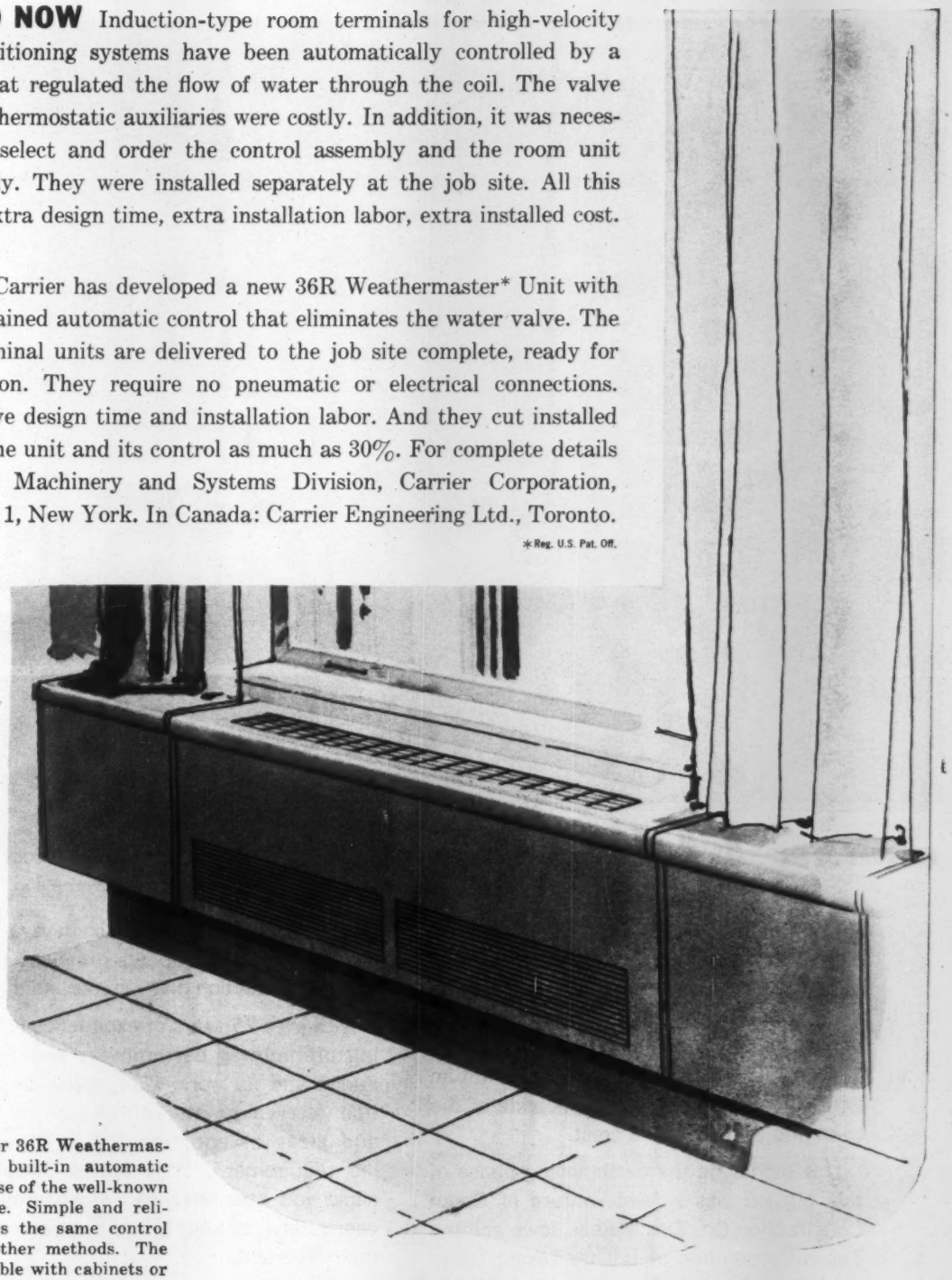

The new Carrier 36R Weathermaster Unit with built-in automatic control makes use of the well-known bypass principle. Simple and reliable, it provides the same control versatility as other methods. The units are available with cabinets or for furred-in applications.

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BETTER AIR CONDITIONING FOR EVERYBODY EVERYWHERE

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another earthmoving job...

another EUCLID *job!*

Hills Creek Dam, in western Oregon, is part of the Willamette Valley Project being built by the Corps of Engineers to provide flood control, navigation, power and irrigation. Scheduled for completion in 1961 this 11 million yd. earthfill embankment will be 2400 feet in length, 1600 feet wide at the base and 24 feet at the crest.

Low bidder on the earthmoving phase of this big job was a joint venture of Green Construction Co., Des Moines, Iowa and the Tecon Corporation of Dallas, Texas. These contractors are using a fleet of 28 big Euclids . . . twenty bottom-dumps of 17 and 30 yd. struck capacities and eight 22 and 27-ton capacity rear-dumps...to haul earth and rock fill to the dam site. The "Eucs" work two ten-hour shifts six days a week and have marked up an excellent record of high production and job availability.

With over 25 years of experience in building off-highway earthmovers exclusively, Euclid and its world-wide dealer organization offer a greater dimension in types and sizes of equipment that meet any job requirement. Your Euclid dealer can show you how advanced engineering and easier service-ability brings a greater return on investment.

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Another Test for Prestressed Ties

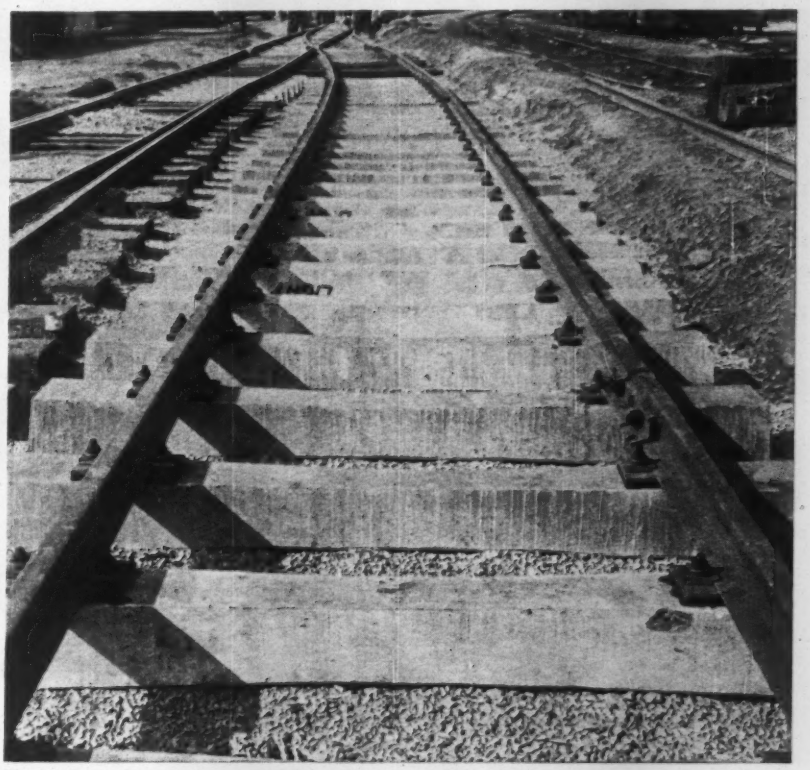
Almost simultaneously with test installations on the East Coast (ENR Mar. 10, p. 26), the Western Pacific Railroad laid a number of prestressed concrete railroad ties on a section of their line in San Francisco.

Ties for Western Pacific were manufactured by Ben C. Gerwick, Inc., San Francisco and Los Angeles. Gerwick engineers designed the ties in conjunction with Western Pacific personnel. Design of the ties closely parallels those that have been used successfully on European railroads, principally in Germany. Use was made of test data developed by the laboratory of the Association of American Railroads in Chicago.

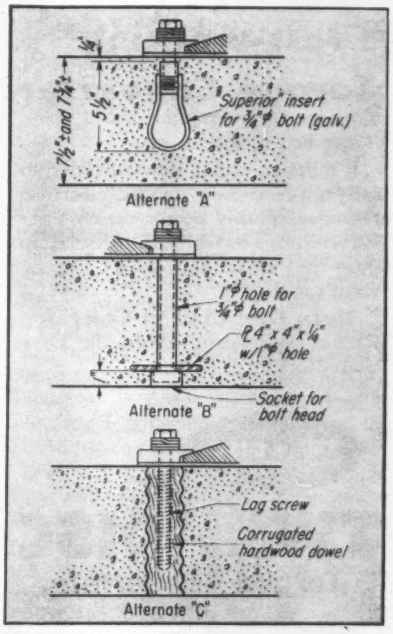
In addition to the tie itself, Western Pacific is testing three different rail-to-tie connections (see drawing).

Several questions have yet to be answered about prestressed concrete ties before they can be used in any extensive quantities, according to Frank Woolford, Chief Engineer for Western Pacific.

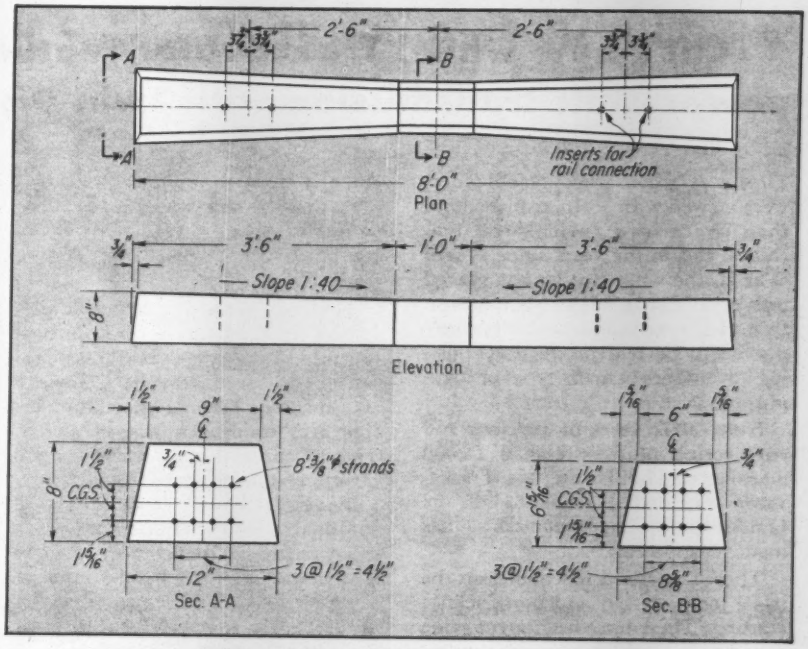
More information is needed on the best type of rail-to-tie connection, methods of tamping ties, handling techniques (prestressed ties weigh over 500 lb each, as compared with 200 lb for timber ties), effect of car derailments, track maintenance, and costs.



First West Coast ties resemble those used in Europe.



Rail-to-tie connections . . .



. . . are a part of this test installation.

Smooth Operator!

Cat's new wheel Traxcavator features fast-working power-shift transmission with Twin Disc Torque Converter

Time was when wheel-type loaders were viewed with scorn as little more than overgrown agricultural machines. But in the years since World War II, the wheel loader has gained universal favor with construction men. Its speed and mobility have proved to be real production-boosting advantages in many types of loading jobs.

Now, after years of research and engineering plus more than 14,000 machine test hours, the 944 Traxcavator — first wheel loader to bear the famous Caterpillar trademark — has made its appearance.

There's no need to enumerate the 944's many design and performance features. These have been given wide coverage in all the construction magazines. It is worth pointing out, however, that the new wheel loader, like so many other Cat machines, is equipped with a Twin Disc Torque Converter.

The torque converter — a single-stage Type 6 model — works in conjunction with the 944's two-speed forward, two-speed reverse, planetary transmission. Each of these four in-line gear trains has its own clutch. Two of the planetary trains are for direction control while the other two provide gear speed selection. Reverse speeds are 25% faster than forward—a key factor in reducing cycle time. The torque converter assures smooth, instantaneous clutch engagement by absorbing the shock of the shift in its fluid circuit.

It takes an actual demonstration to fully appreciate the smooth, effortless response of this power train. Your Caterpillar Dealer will be glad to show you what the Cat 944 Traxcavator can do.

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin. Hydraulic Division: Rockford, Illinois.

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Torque Converters

Wave Deflection Meters Water

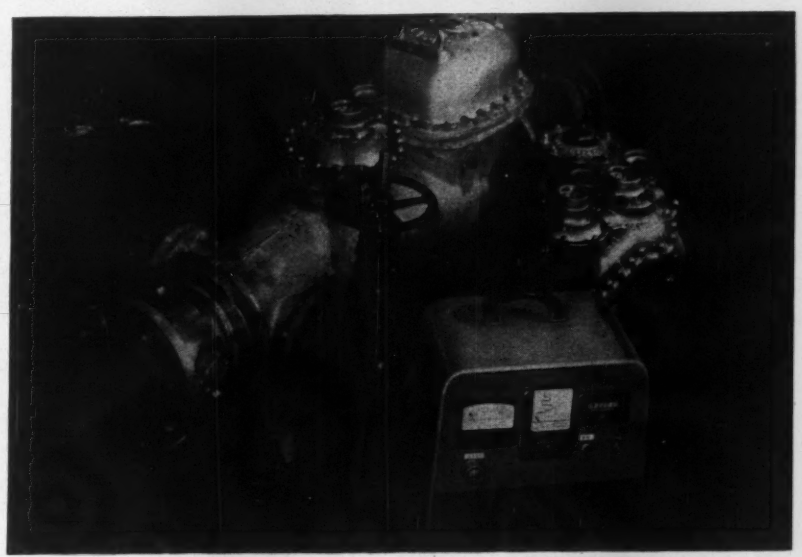
A new ultrasonic device measures liquid flow with high frequency vibrations from outside a water pipe. Prime application of the flowmeter is for checking the accuracy of large water meters already in service.

Basically, the unit consists of two main parts: a pipe section and a flow recorder.

The pipe section is a short piece of bronze or stainless steel pipe identical in length to a standard valve body. On its opposite outside walls are two sets of small transducers. There is nothing inside the pipe, so flow is unrestricted. The pipe section is usually installed permanently in the pipe line near a meter or at some other convenient location.

The flow recorder is an electronic transceiver that records rate of flow and total flow. This device is portable and is wired to the transducers on the pipe section whenever a reading is desired.

Ultrasonic flow meters have been built in the past, but according to the manufacturer, this is the first time that liquid flow has been measured by computing the deflection that the moving liquid causes on a sound wave continuously echoing back and forth between the pipe walls; past devices have always measured the time required for sound waves to cross a known distance in the stream of liquid.



ULTRASONIC FLOWMETER checks conventional water meter by measuring the shift in a sound wave transmitted across a moving liquid.

The flow meter is powered from standard 115-volt ac or a 12-volt battery.

The manufacturer cites the following advantages:

- Large revenue water meters may be checked without interrupting service (the flowmeter is not recommended for small diameter pipe).
- Several pipe transducer sections at various locations could be used with only one portable electronic section.
- Corrosion is eliminated, since no part of the device is in the pipe.

The new instrument was developed in close cooperation with the newly merged Hersey-Sparling Meter Co., Dedham, Mass. GULTON INDUSTRIES, INC., METUCHEN, N. J.

Baby Seismograph Saves Drilling

A miniature engineering seismograph yields reliable information on subsurface conditions without drilling, the manufacturer claims.

Weighing only 16 lb, the portable electronic instrument is said to determine depth to bedrock, and the presence or absence of bedrock or other solids, as well as the identity of subsurface materials.

Only two men are needed to operate the device, the manufacturer says. It measures the time required for the sound of a sledge hammer blow to bounce off subsurface solids back to the electronic counter on the surface.

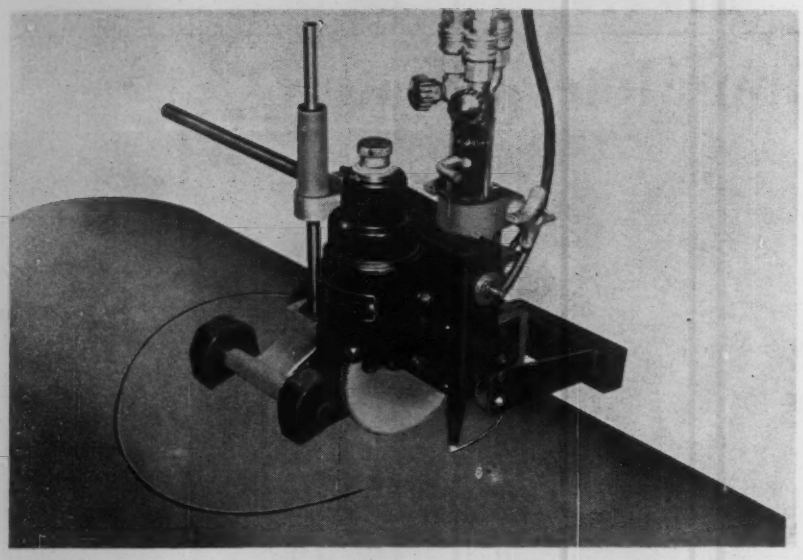
Normal depth determinations can be run in 10 to 20 minutes. Profiles, under ordinary conditions, can be completed at the rate of three quarters of a mile per day at station intervals of 200 ft, according to the manufacturer. GEOPHYSICAL SPECIALTIES CO., 15409 ROBINWOOD DRIVE, HOPKINS, MINN.

Crawler-Mounted Loader Has 2¼-cu yd Bucket

The model 123 crawler-mounted front-end loader has 74-in. gage and bucket capacity of 20,000 lb at carry position. Maximum breakout force with the bucket heeled on the ground is 25,000 lb. The sand and gravel bucket has an SAE rating of 2¼ cu yd; the rock bucket a 2 cu yd struck and 2¼ cu yd heaped capacity.

The unit has a working weight of 29,200 lb and features loader arms, main frame, final drive and center housing of cast steel. A "single-stick" controls all actions of the arms and bucket.

Power is transmitted through "Unidrive" transmission and "Quadra-Torque," giving four speeds both in forward and reverse, flip-of-the-lever gear and direction changes, and a speed range from 0 to 6.5 mph through the single stage industrial type torque converter. Dual final drives power each track independently. THE EIMCO CORPORATION, P.O. BOX 300, SALT LAKE CITY 4, UTAH.



Mechanized Hand Cutter for Pipe

A mechanized hand cutter for pipe, tank, and plate fabricators is designed primarily for cutting round openings in tanks and large-diameter pipe. The cutter also makes straight, irregular or circular cuts in flat plate with equal speed.

A magnetic radius rod permits the center fulcrum to rise and fall with the contour of the tank—producing a perfectly round opening. An oxy-acetylene torch, powered by a small 110v variable-speed motor, makes it adaptable to cutting varying thicknesses. The 23-lb cutter comes complete and ready for immediate operation. Removable handle permits plate cutting from a standing position. Steffan Manufacturing Corp., P O Box 275, Salem, Ohio.

New Model in Scoot-Crete Line

Model N-12, newest of the Scoot-Crete concrete-placing trucks, carries a maximum concrete load of ½ cu yd.

Powered by a 9.2 hp gasoline engine, the three-wheeled N-12 has four speeds forward, one speed reverse. The heavy-duty differential-type drive axle is located directly under the load. The driver can control the dumping unit while seated.

Optional accessories include electrical starting equipment, inter-changeable platform body, headlights, tail-light, and horn. Getman Brothers Manufacturing Division, Highway 31, at Phoenix Rd., South Haven, Mich.

Tough Plastic Buttons Mark Traffic Lanes

A lane-marking traffic button is made of polysulfide base compounds and reflective glass beads. The markers can be bonded to any pavement surface with a special adhesive.

The raised, reflective button surfaces offer improved visibility at night and do not blank out even in rainy weather, according to the manufacturer.

The plastic of which the buttons are made, even when combined with reflective glass beads, is said to be extremely tough and resistant to impact.

The adhesive with which they are applied is a compound with similar ingredients, which is said to develop excellent bond to portland cement or bituminous concrete, brick or granite surfaces.

Traffic buttons made from polysulfide base compounds are said to have a life expectancy of 10 to 15 years as crosswalk and city street lane markers. On the open highway, the cast buttons will provide up to 25 years service, according to the producer.

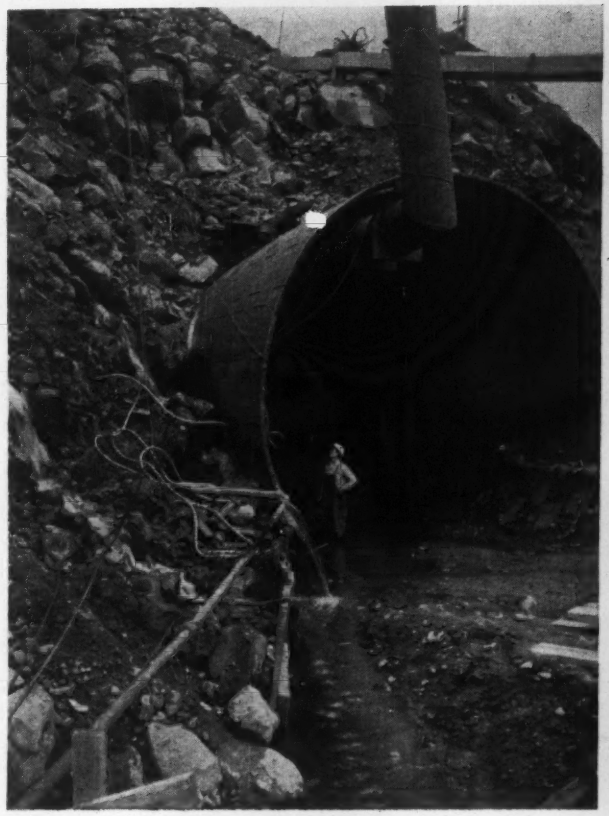
The polysulfide polymer-containing Thio-Line markers are 4 in. in diameter and about ⅜ in. high. Available in white or colors, they are tough enough to be dropped on concrete without breaking. Some of the markers are smooth and rounded, while others have impressions cast in them to provide more reflective surface. Installation is reported to be relatively simple. Thiokol Chemical Corp., Trenton, N. J.

Three-Piece High Lift Boom Fits Hydraulic Excavator

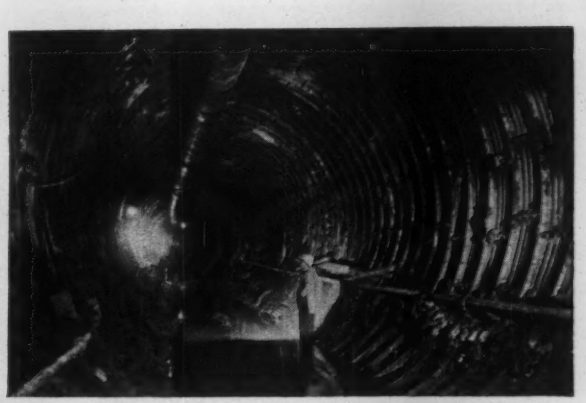
A three-piece, high lift boom, which telescopes hydraulically, is available as standard equipment on the Bucyrus-Erie Model H-3 (Series Two) truck-mounted, all-hydraulic crane-excavator.

The boom is fabricated of alloy steel for greater strength with less weight. The tip section has a gooseneck boom point. The telescoping intermediate section is hydraulically extended or retracted. Fully extended, the boom is 35 ft long. For extra high crane work, 10 and 20-ft jibs are available.

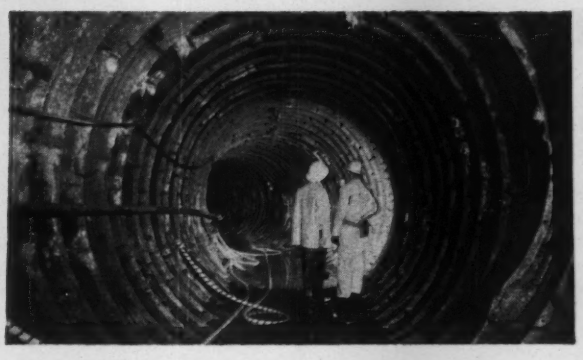
A simple pin arrangement for locking tip section in position permits long or short boom setups in a matter of minutes. For work inside buildings or in extremely cramped quarters, the upper and intermediate sections telescope into the lower section to form a "working" boom only 15-ft 9-in. long. The short boom rests over the truck cab for travel. Bucyrus-Erie Co., South Milwaukee, Wis.



18½ ft. tunnel portal—Terrain shows tunneling conditions encountered.



Plates installed quickly—Necessary for immediate ground support. All bolting is in the open through inside flanges—note staggered joints.



Interior of 9½ ft. tunnel—COMMERCIAL tapered plates provide contiguous lining at lateral curves.

How Liner Plates Lick Mud, Water, 60-Ton Boulders!

The scene: Bull Run Dam Project, Sandy, Oregon. Tunnel Contractor: Gates & Fox Company, Burlingame, California. Tunnel Project Engineer: Mr. E. M. Woodward.

The problem: Two 1,720 ft. tunnels had to be dug to create dry site for building of dam. One diversion tunnel to be 18½ ft. in diameter; the other, a water supply tunnel, 9½ ft. in diameter with 3 lateral curves. Tunnels were 80 to 100 ft. beneath surface of semi-liquid, rhombohedron earth, liberally salted with angular, 100 lb. to 60 ton basaltic boulders. Areas of high-point pressure loading from unsupported rock and overflow from an underground lake further complicated matters.

The solution: The 18½ ft. tunnel was supported by 15,000 COMMERCIAL 5/16" thick liner plates. Each course consisted of 18 full plates 16" x 37½" and 1 half plate 16" x 18¾" to form a complete circle. The 9½ ft. tunnel took 13,000 plates 3/16" thick (9 full and 1 half plate) similarly arranged and, where necessary, tapered to fit 3 lateral tunnel curves. All courses were mined in with staggered joints so no continuous longitudinal seam ran farther than the 16" plate width.

Plates in both tunnels were pierced with 2" grout holes to allow gravel-cement fill outside liner. Well bundled COMMERCIAL liners handled well and fit perfectly, aiding in progress of 12 ft. per 24 hours in large tunnel, 20 ft. per 24 hours in smaller tunnel.

Technical service backs the product: According to Project Engineer E. M. Woodward, "COMMERCIAL SHEARING provides excellent service, superior product design and on-the-spot engineering help for tough situations. They proved they're not the kind of firm to just ship the plates and forget the project... their service was both impressiye and expert!"

For complete details on how COMMERCIAL steel liner plates can simplify and speed up your vertical shaft, surface or sub-surface tunnel project—help make it safer—send today for your copy of Catalog 300-C2. Write to Commercial Shearing & Stamping Co., Dept. E-21, Youngstown, Ohio.

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Loader Has Four-Wheel Drive

The TL-12 front-end wheel loader has four-wheel drive, a carrying capacity of 4,000 lb and a static lifting capacity of 9,500 lb.

It has a power reversing Tractomatic transmission with a lever on the steering column to control both forward and reverse movement without stopping the machine to clutch and shift gears. The lever hydraulically engages the two multiple disks, dry-type clutches—one for forward travel, and the other for reverse. It has a 13-in. single stage torque converter with 3 to 1 ratio.

Four speeds forward are provided to 21.2 mph, and four reverse speeds to 27.9 mph. Reverse speeds are approximately 30% faster than the forward speeds in the same gear. This design permits a faster loading cycle without shifting to a higher gear to achieve the same effect.

The transmission also has an automatic clutch cut-off which disengages the clutch when the brakes are applied. As an added safety factor for work on down-grade or when dozing over banks, the clutch cut-off can be disconnected by a lever in the operator's compartment. The loader is equipped with a pneumatic coupling which provides a flexible, vibration-free connection between the engine flywheel and the torque converter. The coupling consists of a small pneumatic tire completely protected by a housing through which only the valve stem protrudes.

The TL-12 is available with either Allis-Chalmers 77-hp gasoline or 76.5-hp diesel engine. Four buckets are available for the unit, ranging from 1 to 2 cu yd capacities. Bucket tip-back at carrying height is 47 degrees, and there is up to 14,500 lb of breakout force at the cutting edge.

Maximum dumping clearance under the cutting edge is 8 ft 4 in.; under the hinge pin it is 10 ft 3 in. At maximum dumping height, reach from the front of the tires to the cutting edge is 2 ft 8½ in. Turning radius is 19 ft 5 in. with the bucket in carrying position. Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Stronger Paper Improves Packing

A multiwall paper bag with built-in stretching capabilities is helping to reduce contractors' costs by minimizing materials loss and damage that stem from failure of a container or wrapper.

The extensible paper effecting the savings is made by a process patented under the name of Clupak. Clupak, Inc. is a patent and trademark organization jointly owned by Cluett, Peabody & Co., holder of the original patent, and West Virginia Pulp and Paper Co. The special paper is manufactured under license agreements with 12 U. S. and foreign paper producers.

Multiwall bags of Clupak paper are being used for bulk packaging of cement, plaster, gypsum, lime and clay products. The paper is also used as a wrapping material for shingles, tiles, tubing, conduits and irrigation pipes.

Key to the paper's resistance to breaking is its ability to stretch under pressure, thereby making it less vulnerable to impact and shock.

Clupak bags also resist penetration by moisture, producers say. This prevents hardening and lumping of materials.

Because of these characteristics, contractors do not have to order "extra" material to allow for waste resulting from bag breakage and moisture penetration. Clupak, Inc., 530 Fifth Ave, New York 36, N. Y.

Self-Propelled Machine Spreads Chips on Roads

Model "SP" Self-Propelled Chip Spreader has a central control tower that permits the operator to direct the power plant conveyor, feed roll, feed augers, feedgate and hitch from a single station.

Material flow is synchronized to actual ground speed of the spreader. A single, high capacity, 36-in. wide, mining-type conveyor belt delivers the material from the rear to the front hopper. The rear hopper (3.5 cu yd struck) has an adjustable feedgate to maintain the required amount of material into the front hopper.

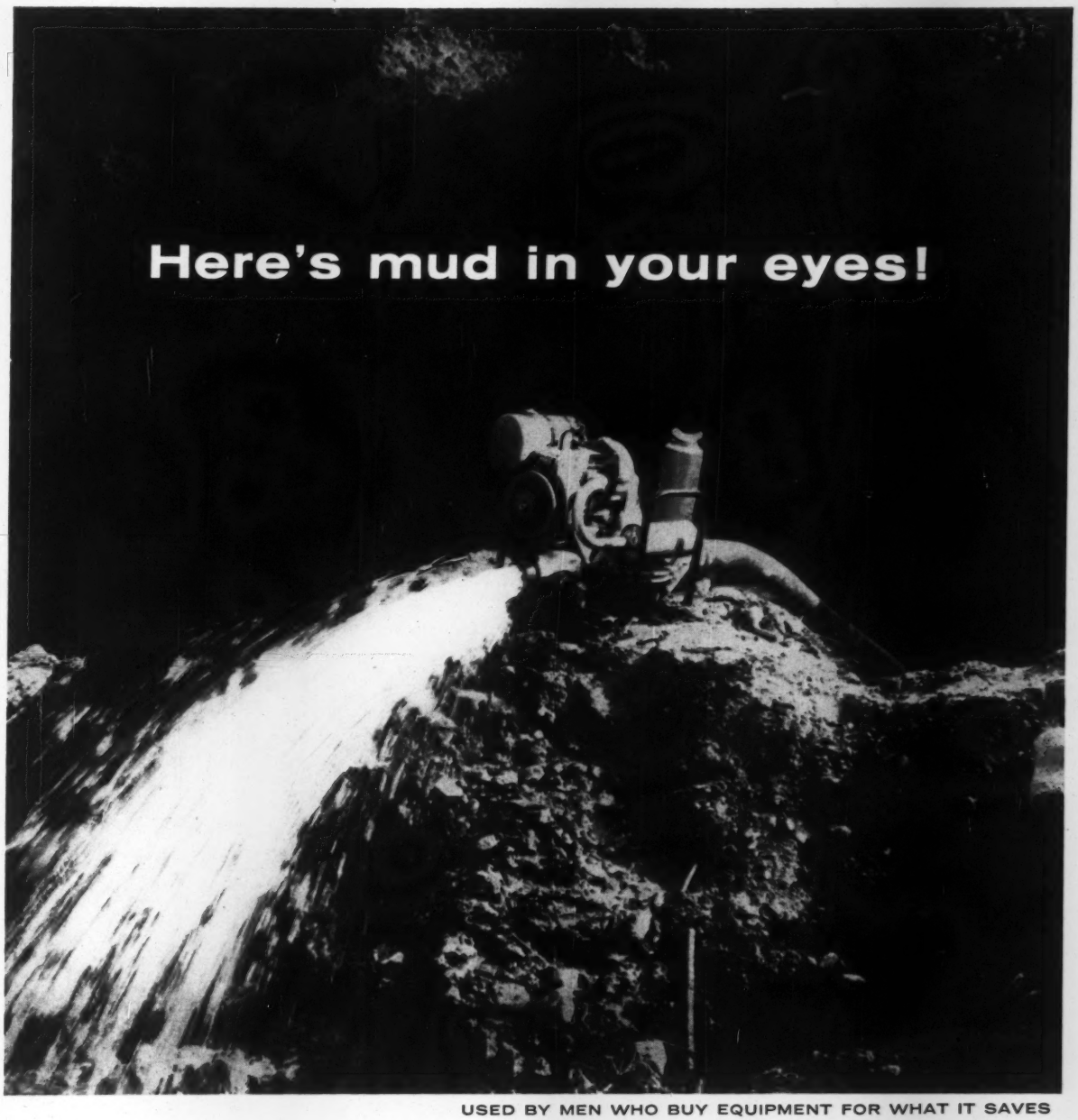
Spreading from the front hopper is accomplished by a 13-ft symmetrical feed roll. An agitator operates simultaneously with the feed roll insuring an even, well distributed surface coat, according to the manufacturer.

The unit has an 88-bhp gasoline engine with a 2.2:1 torque converter. The automotive type transmission has five speeds forward and one reverse. Operating range is from 0 mph to more than 20 mph travel speed forward; over 10 mph in reverse. The spreader has an independent main frame. Highway Equipment Company, Dept. H24-9, 616 "D" Ave., N.W., Cedar Rapids, Iowa.

Versatile Jeep Can Take Different Attachments

The Willys Jeep has a wide range of uses, including nearly 150 factory-approved accessory attachments. Models range from a ¼-ton gadabout with a tasseled canopy to the practical forward-control, 800 GVW Model 170 shown here.

Any model can be obtained with either two or four-wheel drive. In the smaller models, an ohv, 72-hp four-cylinder engine is used. Only other option is a six-cylinder, L-head design that puts out 105 hp at 3600 rpm. Three and four speed transmissions are available as are a wide variety of winches and power-take-off locations. Willys Motor Inc., 940 North Cove Boulevard, Toledo, Ohio.



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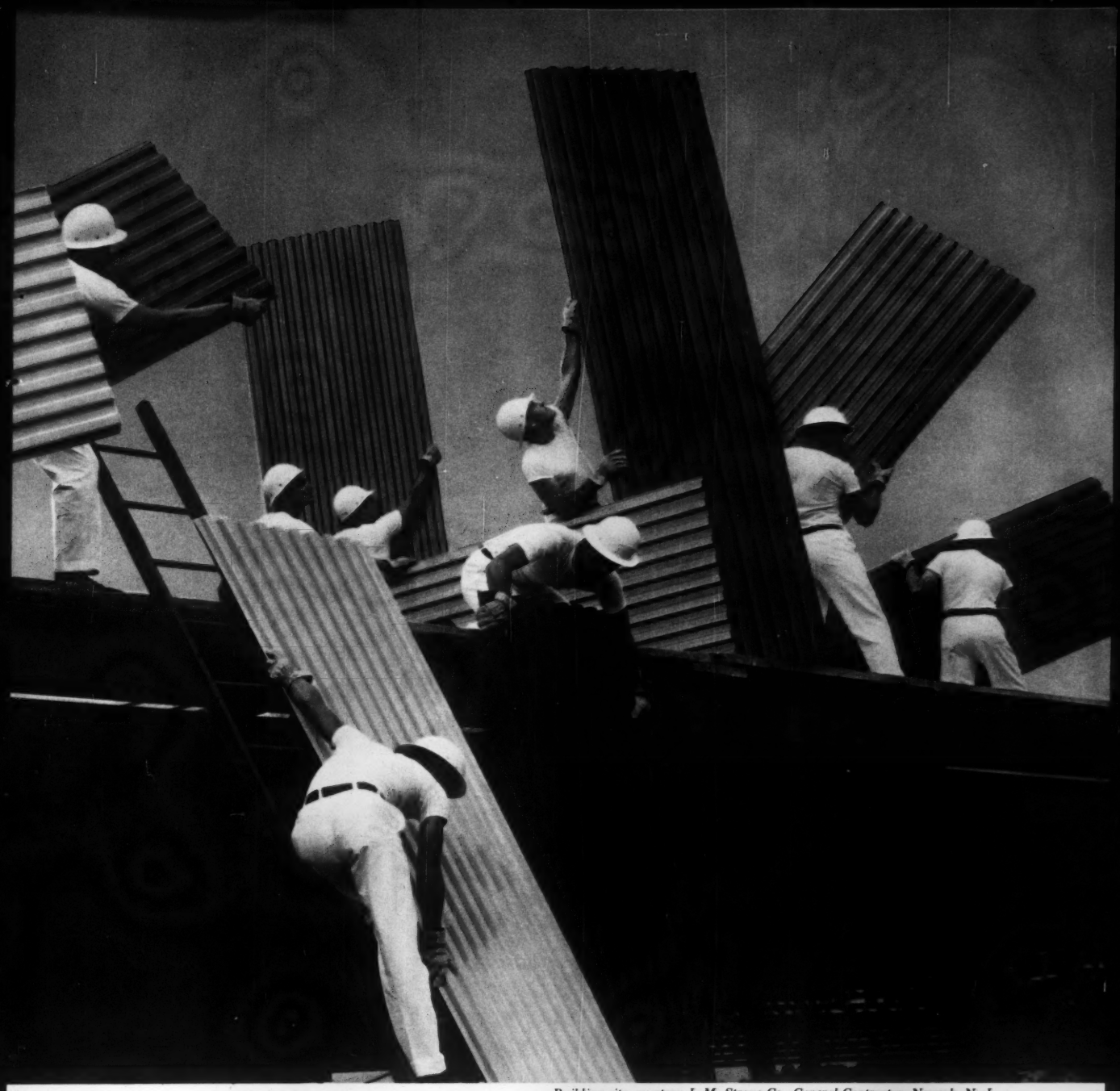

Building site, courtesy J. M. Straus Co., General Contractor, Newark, N. J.

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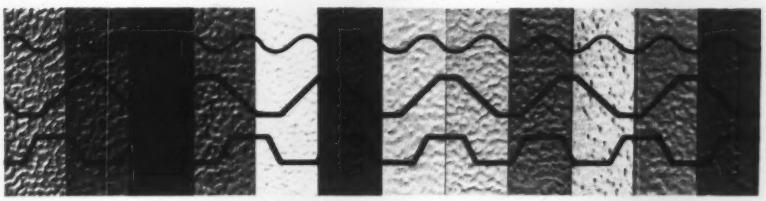

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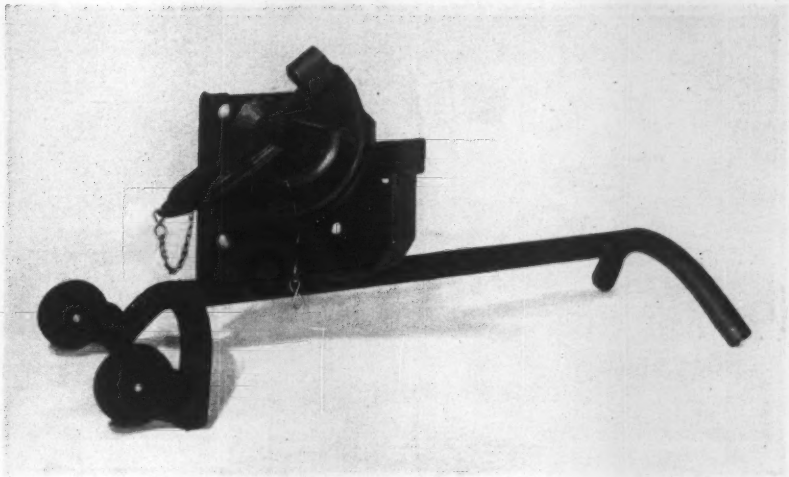

Improved Conduit-Pipe Bender

Redesign of a conduit and pipe bender has reduced its weight about one-third, the producer states. Weight reduction through use of high-strength steel, plus a new wheeled stand, make the unit portable.

The new stand is more stable and has provision for leg extensions of standard one-inch conduit or pipe so that the bender can now be set at any desired working height. The new pawl and pawl release assembly are sturdy and more easily accessible. Protected location of the control prevents accidental damage. Bulletin 560-1 is available upon request. LIDSEEN OF NORTH CAROLINA, INC., 1071 FIRST STREET, HAYESVILLE, N. C.

Vibrating Screed Adjusts to Slab Mix

The Maginniss vibrating screed assembly consists of a vibrating unit and a pair of end dollies. These can be mounted on a wooden beam up to 36 ft long. An 8-ft width adjustment of the dollies (4 ft on each end) is provided. When mounted on a 16-ft beam, it is possible to screed slabs of any width between 8 and 16 ft. The telescoping pull handles are adjustable for height.

It is designed for use in concreting floors, walks, airport aprons, bridge decks, ramps, streets, and on certain highway applications.

The standard power unit has a 2½ hp, 4 cycle air-cooled gasoline engine with two enclosed "V" belts driving the eccentric. Vibration frequency on engine driven units is variable (3,600 to 8,000 vpm) which allows selection of a frequency best suited to each mix. A centrifugal clutch permits the engine to idle without vibrating the beam. An electric motor drive, without the clutch but with on-off switch in place of engine throttle, is optional.

Spring mountings isolate the end dollies from vibrations of the beam, and a "fine" adjustment in the dollies is provided to prevent the vibrating beam from touching the forms. The dolly rollers have removable flanges which permit them to travel on wide forms or adjacent concrete slabs. Moving the pull handles down raises the beam for easy backing up when a second pass is necessary. MAGINNISS POWER TOOL COMPANY, 154 DISTL AVE., MANSFIELD, OHIO.

Synthetic Insulates Pipe For Extreme Temperatures

Production has begun on a foam-type pipe insulation designed to withstand thermal shock over a temperature range of several hundred degrees. Named UNARCO-U-200, the polyurethane insulation is efficient at temperatures ranging from −300F to 220F. The product is aimed at a wide range of applications in many industries, including the chemical and petroleum fields, power plants, cold storage facilities, and gas pipeline transmission. The material is described as an extremely lightweight, closed cell synthetic. It is reported to be waterproof, vapor resistant, non-toxic and to have high compressive and flexural strength. The company says recent tests reveal a thermal conductivity K of 0.14 at 70F. UNION ASBESTOS & RUBBER CO., CHICAGO, ILL.

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Construction Products Division,

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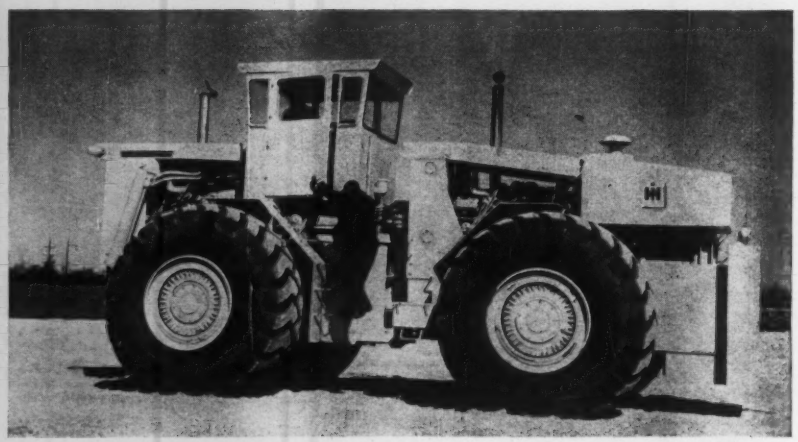


Twin-Engine Dozer Packs 750 hp

Shakedown tests on a mammoth 75-ton twin-engine earthmover will get under way this spring at a road-building project in the midwest.

Designated the PD-105 Pusher Dozer, it is composed of two two-wheeled tractors joined back-to-back. Each pair of wheels in the articulated rig is powered by a 375-hp, six-cylinder, 817-cu in. diesel engine.

Designed to operate either forward or backward, the experimental model mounts a 14-ft, 8-ton hydraulic dozer blade on the front unit, while the rear unit is equipped with a 12-in. thick steel plate for push-loading scrapers.

Top speed is 21 mph, which can be increased 4 mph with optional high speed gearing.

The 30-ft-long rig is remarkably maneuverable, according to the manufacturer, and can turn in a 24-ft radius. The front axle carries 77,400 lb and the rear axle 72,200 lb when each of the four 32-ply tubeless 33.5 x 33 in. tires is loaded with 10,000 lb of dry ballast. With good traction it can push or pull 90,000 lb, which is about 65% of its gross weight.

The machine features frame steering. The axles are rigidly connected to frame side members, while double acting hydraulic cylinders on each side push in opposite directions to guide the rig by jackknifing. Maximum turning angle is 45 deg.

The PD-105 steers with a conventional wheel. Twin accelerators on the control turret permit single or dual acceleration with one foot.

Transmissions are single stage, torque converter driven, power shift systems, providing four speeds forward and reverse. A single lever serves both transmissions as a range selector. Another lever controls forward and reverse for both systems.

The operator has a commanding view from about 13 ft (eye-level) above ground. His seat, the steering wheel, accelerators and brakes are mounted on a turret which turns easily on roller bearings. To change direction, the operator kicks a release and spins the turret around. This trips a switch reversing the hydraulic oil flow in the steering system so the machine steers the same forward or backward.

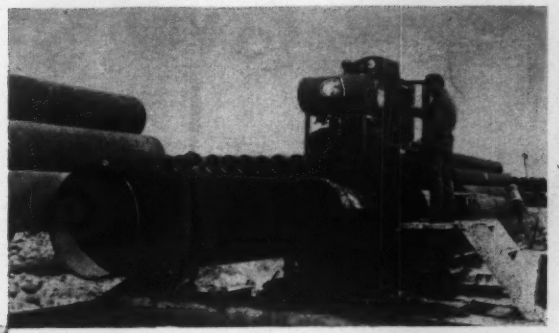
Maneuverability through articulated power steering, plus high speed dozing and the ability to push-load a scraper in either direction, makes the PD-105 unique among vehicles of its type, power and size, according to the manufacturer. International Harvester Co., Construction Equipment Engine Dept., 10400 West North Ave., Melrose Park, Ill.

Runway Marker Lights Tilt If Hit

A medium intensity airport runway marker light (Model 2 Type ERL) has a spring mounted tilting cone. A sheet steel spring allows the cone to tip slightly, instead of breaking off, under stress.

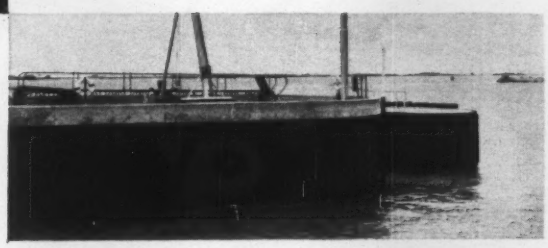
Model 2 ERL fixture with clear or green globe is normally used on non-instrument runways, and has several styles of mounting base. With blue symmetric globe it can be used for standard taxi light locations, such as intersections, corners, and short taxiways. An asymmetric blue globe, which provides two main beams, is available for long straight taxi strips. Crouse-Hinds Company, Syracuse 1, New York.

COAL TAR makes the vital difference . . .



IN PIPELINE COATINGS

that give proved lifetime protection

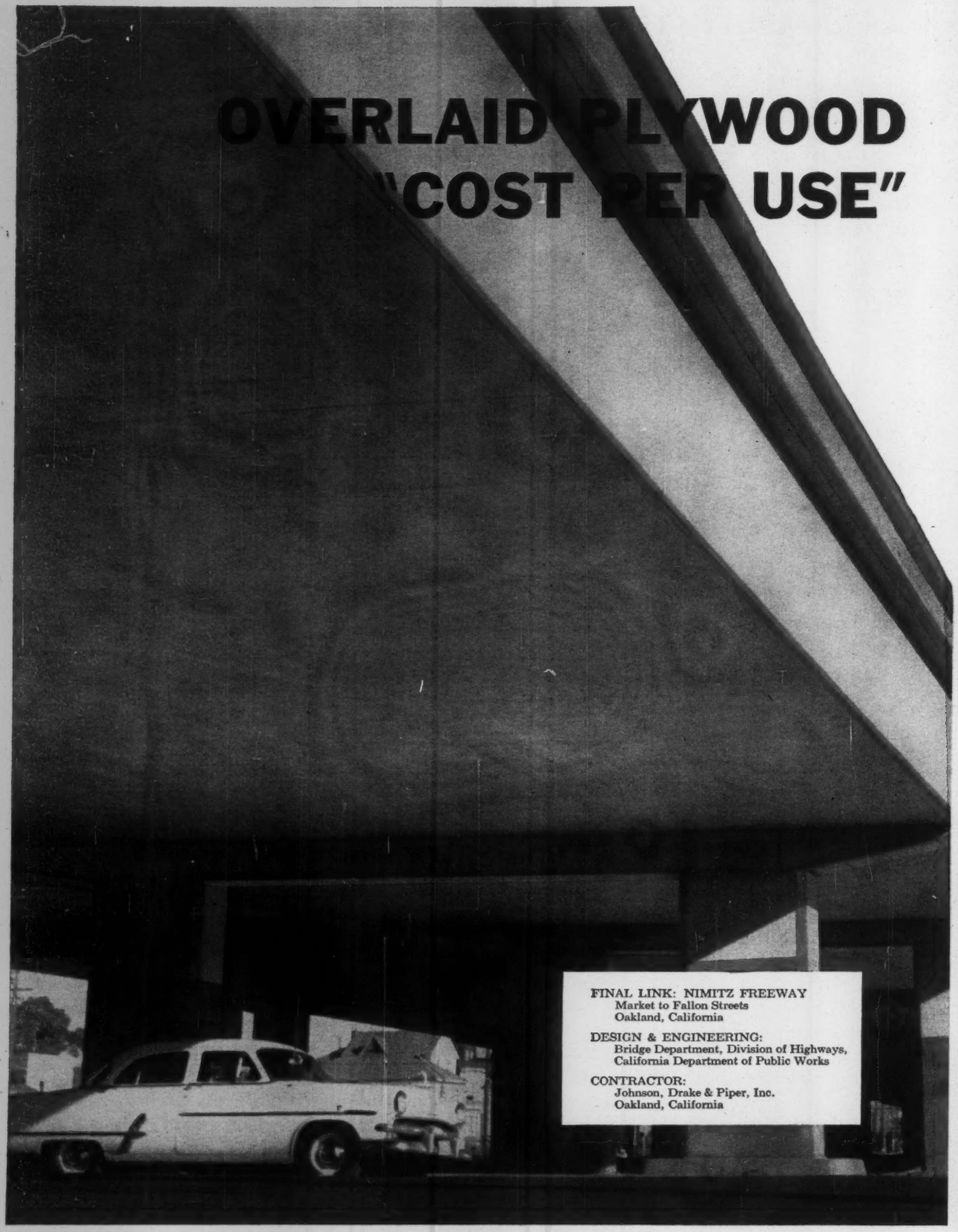


The headline might better read "that give *proved* life*line* protection," for the underground arteries supplying our gas and oil are truly lifelines. To keep these products flowing, modern pipeliners protect the steel pipe against corrosion by the use of protective coatings, supplemented with cathodic protection. But costs can sky-rocket if the coating fails, requiring heavy cathodic protection current. • That's why so many modern pipelines are protected with *proved* Bitumastic® Coal Tar Enamels: *proved*, because coal tar enameled lines have lasted for 30, 40, even 50 years underground! • You may not be a pipeliner, but the thick, tough waterproof protection of Bitumastic Coal Tar Enamels can help prevent corrosion *wherever* metals go underground . . . and underwater, too! Ask your Koppers corrosion-specialist for more details.

KOPPERS TAR PRODUCTS DIVISION, PITTSBURGH 19, PA.

District Offices: BOSTON • CHICAGO • LOS ANGELES • PITTSBURGH • NEW YORK • WOODWARD, ALABAMA

OVERLAID PLYWOOD "COST PER USE"

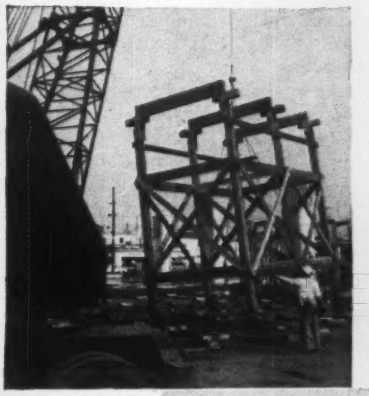


FINAL LINK: NIMITZ FREEWAY
Market to Fallon Streets
Oakland, California

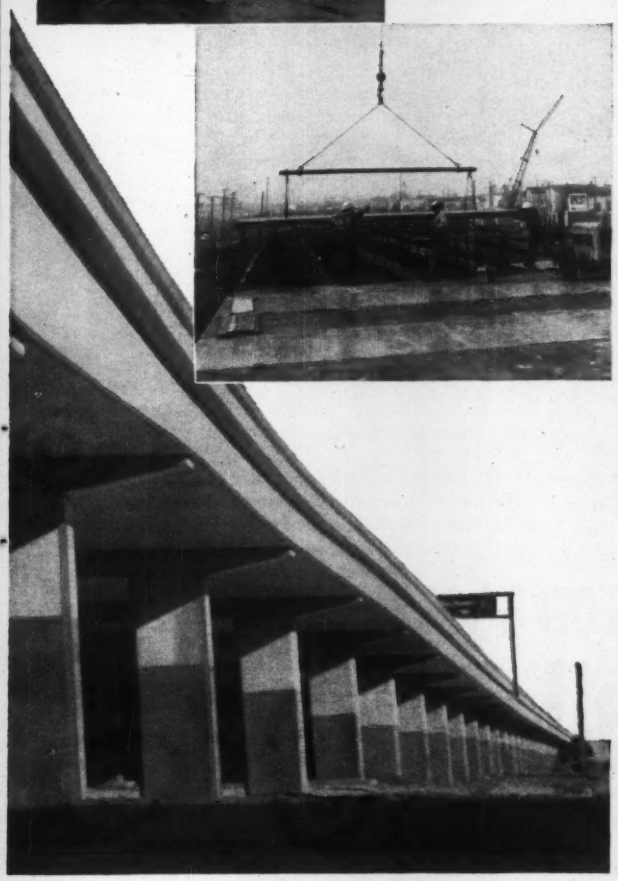
DESIGN & ENGINEERING:
Bridge Department, Division of Highways,
California Department of Public Works

CONTRACTOR:
Johnson, Drake & Piper, Inc.
Oakland, California

FORMS GIVE LOWEST ON ELEVATED HIGHWAY



In carefully planned sequence of operations, prefabricated shoring towers were positioned, screw-jacked to required height. Deck form sections were then crane lifted into position.



High density overlaid plywood concrete form panels give over 50 re-uses, cost less than .007¢ per sq. ft. of form per pour.

"THE EXTRA RE-USES we got from overlaid plywood more than offset its greater initial cost," says George Krenkel, project manager for Johnson, Drake & Piper, Inc., contractors for this 1.55-mile long 8-lane elevated highway.

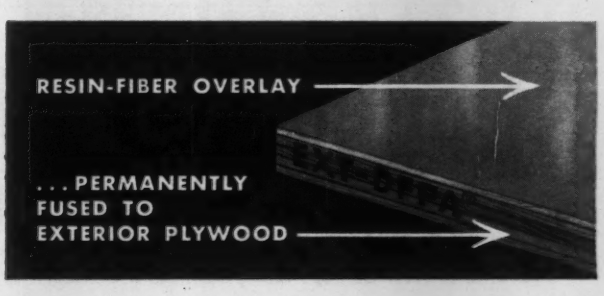
"Even after giving upwards of 50 re-uses, a large percentage of the panels were salvaged for additional use on other jobs," Mr. Krenkel reports. "Besides being more economical in terms of cost per use, overlaid plywood creates much smoother concrete and is easier to strip and clean."

On the job over 50,000 sq. ft. of ⅝" overlaid plywood was used for deck slabs, columns and guard rails. Prebuilt 8′ x 20′ and 8′ x 22′ deck forms were supported by ingenious prefabricated shoring towers which were leap-frogged as pouring progressed. Screw jacks were used to raise towers to required heights. Stripping was accomplished simply by lowering jacks until the forms came free.

DOUGLAS FIR PLYWOOD ASSOCIATION
TACOMA 2, WASHINGTON
—a non-profit industry organization devoted to research, promotion and quality control

HIGH DENSITY OVERLAID FIR PLYWOOD is a premium concrete form panel intended for jobs that require ultra-smooth concrete surfaces and/or many re-uses (up to 200 re-uses may be obtained with properly designed and constructed forms). Base panel is EXT-DFPA® Exterior plywood.

Standard concrete form grades are: *Interior PlyForm®* with water-resistant glue for multiple (up to 10-12) re-uses; *Exterior PlyForm®* (waterproof glue) for up to 25 or more re-uses.



It pays an engineer to remind himself that concrete starts to break down the instant the forms are off . . . in major or minor degree depending on weather, corrosion or moisture pressure. When conditions are severe, no reminder is necessary, but somewhat more obscure is the need for high quality protective materials. Inferior coatings always cost more eventually.

Since 1912, Standard Dry Wall, Inc. has been in no other business than the protection of masonry, and its products are leaders in the field. Thoroseal, for example, may be easily applied with our money-saving, long-handled brush, and will impart both a waterproof and decorative surface in gray, white or color. Write for our free specification folder on all Thoro System products.

Please send new 20-page specification guide describing all products and uses.

Name_____

Company_____

Address_____

Standard | Dry Wall Products, Inc.

Box X-2 New Eagle, Pa.

Plants at New Eagle, Pennsylvania and Centerville, Indiana

. . . New Products

All-Hydraulic Rear Dump Wagon Carries 12 Tons

The all-hydraulic TR-160 rear dump motor wagon has a carrying capacity of 12 tons—7.7 cu yd struck and 12 cu yd heaped.

The unit is powered by a six-cylinder Allis-Chalmers supercharged diesel engine rated 155 hp at 2,200 rpm. A five-speed, constant-mesh transmission provides forward speeds from 3 to 25.4 mph, and reverse at 3 mph.

The TR-160 is equipped with KONTORK differential, which automatically controls the amount of torque delivered to each drive wheel in relation to traction requirements.

The 7-ft 11-in.-wide unit can make a non-stop 180 deg turn in 22 ft 8 in. with a 1/6 turn of the steering wheel. Hydraulic power is provided by a tandem pump, which is gear-driven from the rear of the engine crankshaft.

The TR-160 is mounted on four 18.00 x 25 tubeless rock tread tires. When empty, two-thirds of the weight is carried on the tractor tires; when loaded, 49% of weight is carried on the tractor wheels and 51% on the wagon wheels.

The wagon body has a loading area of 11 ft by 7 ft 10 in. and an average 7-ft loading height.

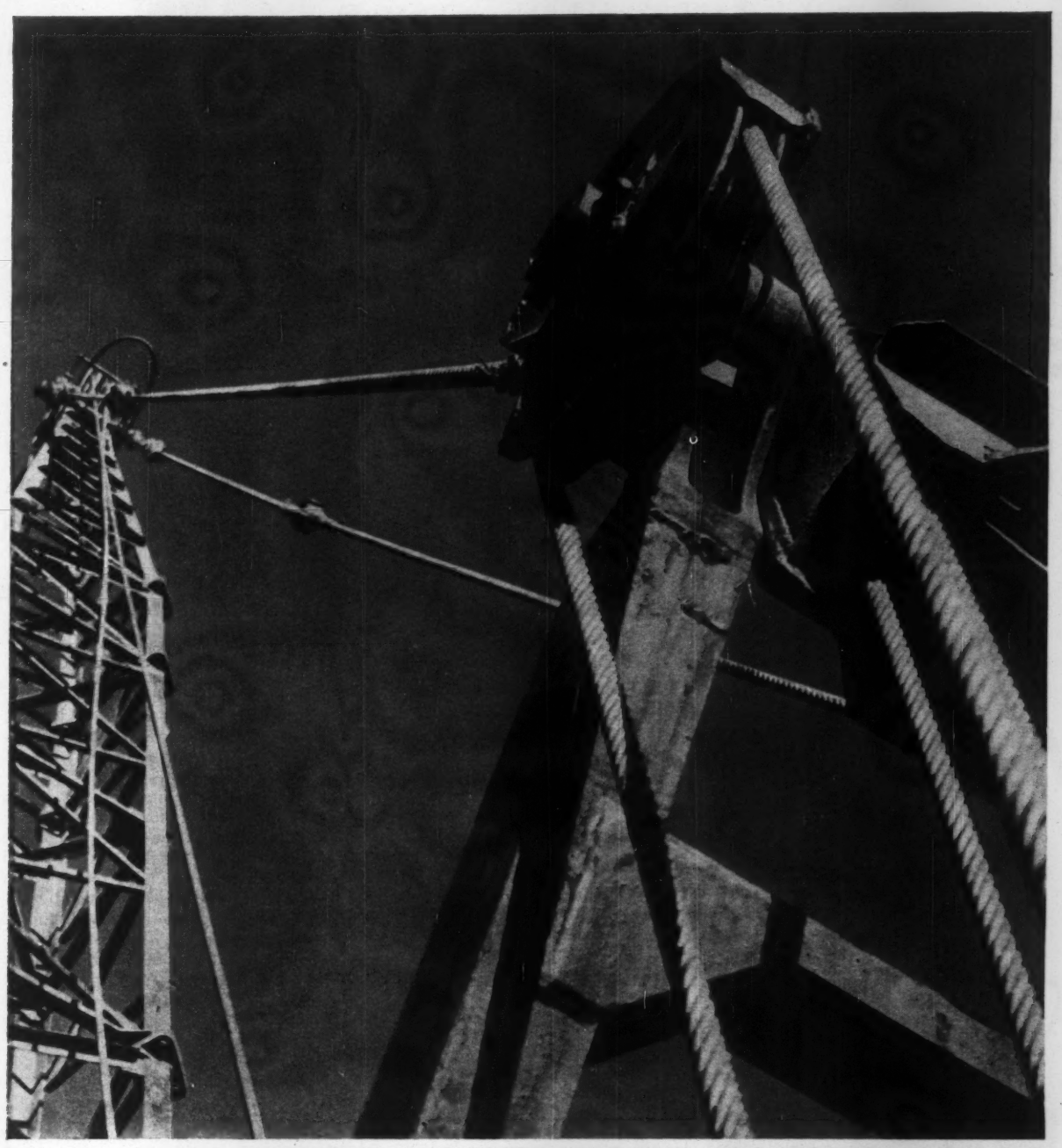
Two double-acting hydraulic jacks provide dumping power to a maximum angle of 52 degrees. When fully loaded, there is 26 in. of clearance under the wagon axle. The rear dump wagon is interchangeable with the 7 cu yd S-160 scraper. ALLIS-CHALMERS MFG. CO., MILWAUKEE 1, WIS.

Improved Tire Made For Utility Tractors

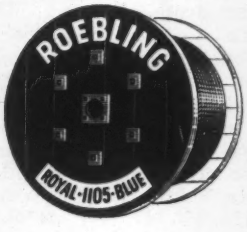
The Firestone All Traction Utility tractor tire is available as original equipment on new tractors.

Changing the "face" of the regular bar-type agricultural tire tread, Firestone research and development engineers have designed a new tread that features shorter, wider traction bars that give 58% more tread contact area. This gives tractor operators two advantages, according to the manufacturer: (1) needed traction for off-the-road jobs; (2) double the tread life on hard surface roads.

This tire is built with Firestone's shock-fortified cord body for greater resistance to impact breaks. Having six plies for tough industrial work, the tire is made with Firestone Rubber-X tread rubber. FIRESTONE TIRE & RUBBER CO., 1200 FIRESTONE PARKWAY, AKRON 17, OHIO.



IF THE WIRE ROPE YOU'RE USING HASN'T GOT IT HERE...IT HASN'T GOT IT

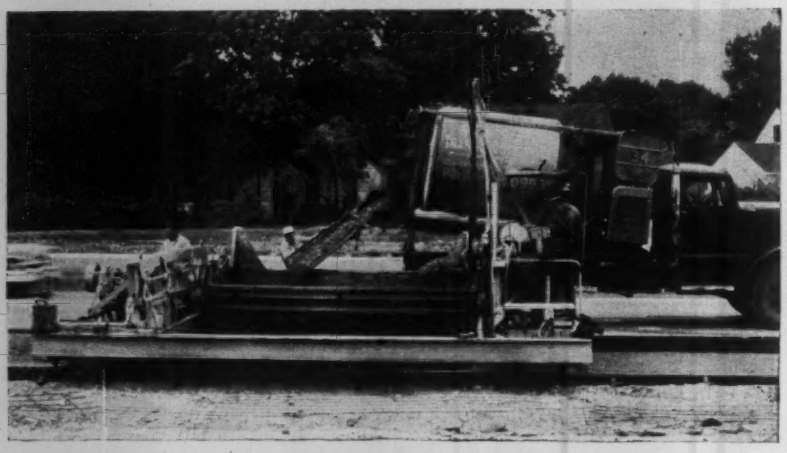


This rope has it—and has it at every critical point of wear for these reasons:
Extra Resistance to Bending Fatigue · Extra High Strength
Good Flexibility and Excellent Resistance to · Shock · Abrasion · Impact · Crushing
For anything you want to know about Roebling Royal Blue Wire Rope, ask your Distributor or Roebling's Wire Rope Division, Trenton 2, N. J.

ROEBLING

Branch Offices in Principal Cities *John A. Roebling's Sons Division · The Colorado Fuel and Iron Corporation*

DUMPCRETE CONCRETE SPREADER WORKS FAST WITH TRUCK MIXERS FOR WIDENING AND STREET PAVING!



SPREADS, MOVES AND STRIKES OFF IN 30 SECONDS!

Speed paving work with transit-mix trucks on widening or street jobs with a Dumpcrete Concrete Spreader. New single-lane model spreads up to 16 ft widths; adjustable in 6-inch increments from 11 to 16 ft. Capacity ranges from 180 to 260 cu. yds. per hour. Places full depth, base course or top course. Hydraulic controls. Handles concrete of lowest workable slumps. Send for new catalog with specifications and drawings.

Send this coupon today

MAXON
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MAXON CONSTRUCTION COMPANY, INC.
Manufacturing Division No. E-13 • 2600 Far Hills, Dayton 19, Ohio

Please send me new Dumpcrete Concrete Spreader catalog with specifications.

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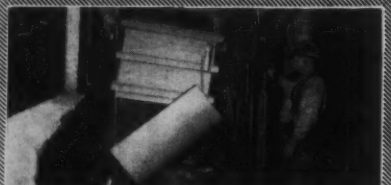

ALPINE BOTTOM DUMP CARS
. . . simplify handling sticky muck or ores, save time. Pneumatic dump controls permit easy, one-man operation.

MAYO
TUNNEL AND MINE EQUIPMENT
Lancaster, Penna.

FOUNDATIONS

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DALLAS TEXAS
1208 Industrial
RIVERSIDE 7-8525

BELL BOTTOM FOUNDATION CO.

. . . **New Products**

Tiny Trencher-Backfiller Has Crawler-Type Tracks

A crawler-type trench and backfill machine features positive traction, hydraulic variable speed drive, instant forward and reverse, and ease of control.

Digging widths are 3, 4, 6, 10 and 12 in., and are obtained from only two tooth combinations. The boom telescopes and is adjustable to 42, 54 and 66-in. maximum depths. Trenching speed is from 1 to 12 ft. per min. The unit is powered by a 12.5 hp. engine.

A special backfill blade attaches to the boom and is raised or lowered hydraulically. It can be positioned at the center point for direct dozing and angled to the left. It also can be set in an offset position, angled to the left, to pull the spoil back into the trench while the unit is operating parallel to it. Davis Manufacturing, Inc., 1500 S. McLean Blvd., Wichita, 13, Kan.

Tractor Shovel Can Turn In Less Than Its Length

A heavy-duty, rubber-tired tractor shovel, with short turning radius designed principally for industrial bulk materials handling, has a lift capacity of 5,400 lb. Equipped with a 1-cu yd bucket, the 15-ft 8-in.-long tractor shovel has a turning radius of only 11 ft 2 in.

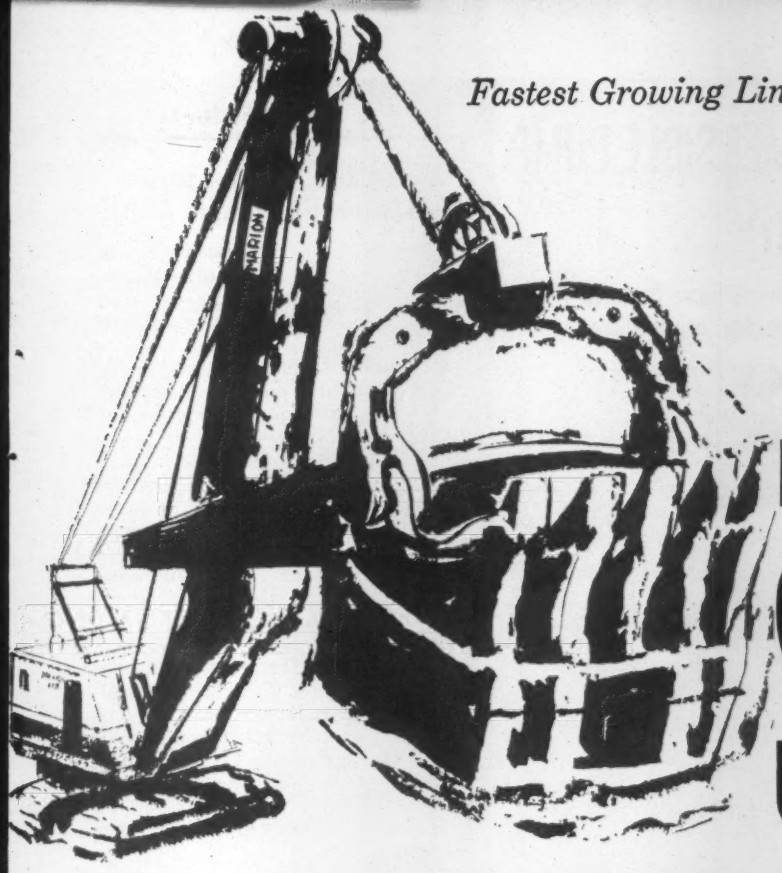
Capable of traveling at speeds up to 26 mph in either forward or reverse, the Model 55B is powered by a 66.5-hp gasoline engine. It has bucket-wheel drive with planetary gear reduction in the driving wheels. The machine has the Michigan power train with torque converter and power shift. Total working weight is 10,200 lb. Maximum dumping height is 8 ft. Construction Machinery Division, Clark Equipment Company, Pipestone Road, Benton Harbor, Mich.

Material Spreader For Soil Stabilization

The Model "TCS" Material Spreader features one-man operation, 8 ft spreading width, and accurate metering of materials from 5 to 7 lb per sq yd.

Gate is set by cranking the jack-type feedgate open, setting three calibrated dials for correct depth of spread, and locking the jack. A single lever activates the transmission, agitator and conveyor. The drive shaft control lever disengages either drive wheel for cornering. All four controls are mounted within the operator's reach on the left side of the towed unit for easy coordination with the truck driver. Highway Equipment Co., Dept. H24, 616 "D" Ave., N.W., Cedar Rapids, Iowa.

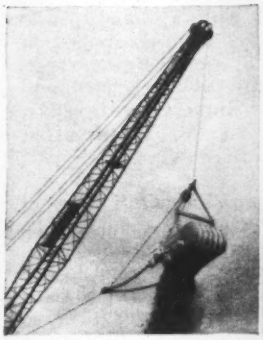
Fastest Growing Line in The Industry



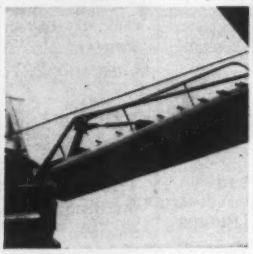
COMING AT YOU FOR THE SIXTIES!

THE NEW MARION 111-M

From crawler to boompoint sheave, today's Marion 111-M is, pound for pound, the finest excavator in the world. It's 80 ways better than its predecessors for the BIG jobs of the Sixties. For example:

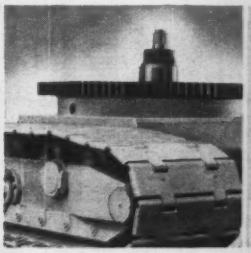


• Standard boom length increased from 50′ to 80′ . . . lifting capacities up over 25%!

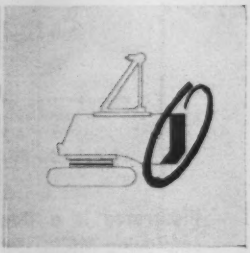


• Shovel boom weight increased 38%, promising a rugged front end that will keep digging under the most adverse conditions!

• Where it counts! Shovel capacity up over 40%!



• Lower frame and crawler assembly substantially heavier for toughest rock work!



• Increased rear swing radius for improved machine stability, bigger shovel and crane capacities!

Write today for Bulletin No. 457 which tells the full, dramatic story of the new Marion 111-M.

What this machine could do yesterday . . . it does faster and better today. If your needs are for a mobile, fast-cycle, low-maintenance excavator that balances with modern haulage units for more profitable construction work, look to the Marion 111-M. It's THE machine in its class.

MARION POWER SHOVEL CO., MARION, OHIO

A Division of Universal Marion Corporation

SPECIFY A *Proven* SUBMERSIBLE PUMP

SPECIFY "weil"

weil Submersible Sewage and Sump Pumps have been in use since 1951. There is no substitute for experience.

NOW AVAILABLE in a choice of two motors

1750 R.P.M. and Low Speed 1140 R.P.M. for longer life, less wear and improved non-clog characteristics.

NOW AVAILABLE with a choice of two controls

Conventional float switch

MICRO Pressure switch (as illustrated)

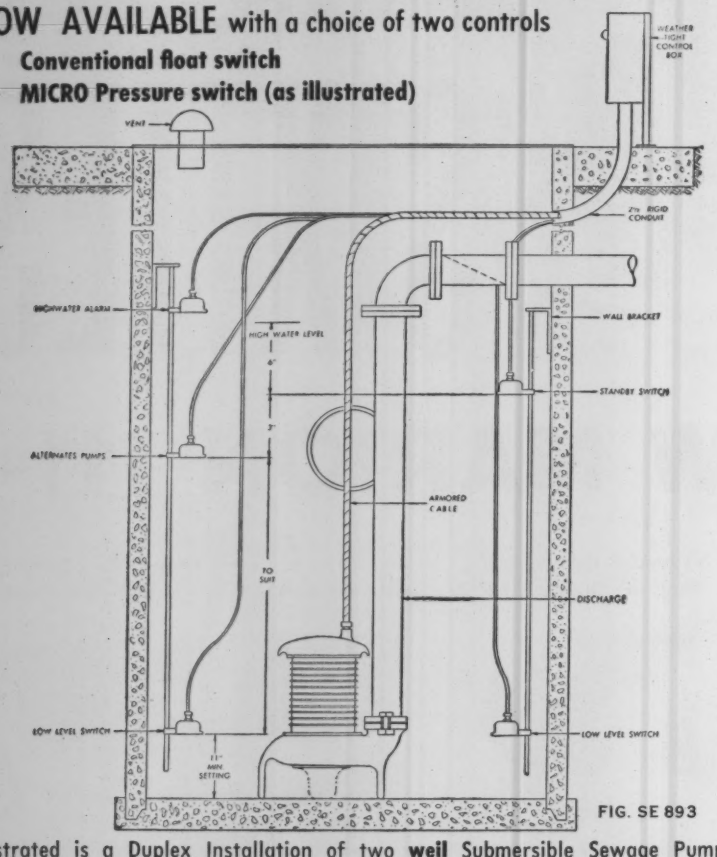


FIG. SE 893

Illustrated is a Duplex Installation of two **weil** Submersible Sewage Pumps employing MICRO Switch controls to start and stop pumps; to alternate pumps; and to provide for high water alarm. Note the ease with which switches are positioned (or changed) to control water levels. The Submersible MICRO Switch has no exposed moving parts, needs no servicing and coupled with the **weil** Submersible Pump provides an extremely efficient non-clog trouble-free pumping system.

weil Submersible Pumps are manufactured in discharge sizes of 3" to 6" and capacities to 2000 G.P.M. There is a **weil** Submersible Pump to meet all requirements. **Now approved by the CANADIAN STANDARD ASSOCIATION Testing Laboratories.**

Send for Bulletin SE-860 for complete engineering information.

weil PUMP COMPANY

1528 North Fremont St. • Chicago 22, Ill.

. . . New Products

Punch-Card Automation For Concrete Plants

Automatic control of concrete batching and mixing by an advanced punch-card system has been perfected. It is applicable to both stationary and portable concrete plants.

An infinite number of mixes can be obtained with this punch-card method, using a vinyl card pre-punched for any mixing formula desired.

When the card is inserted, a "reader" instantly interprets the instructions and the batching sequence begins. With no further action on the part of the operator, precisely controlled weights of water, cement, and aggregates are mixed in a preset cycle and discharged at exactly the right time, according to the manufacturer.

The punch-card automation system permits control for air-entraining, high early strength or plasticity; discharge of all or part of a batch; charging speed; and operation of moisture compensators. Manual controls are provided for use whenever desired. CHAIN BELT CO., 4701 WEST GREENFIELD AVE., MILWAUKEE 1, WIS.

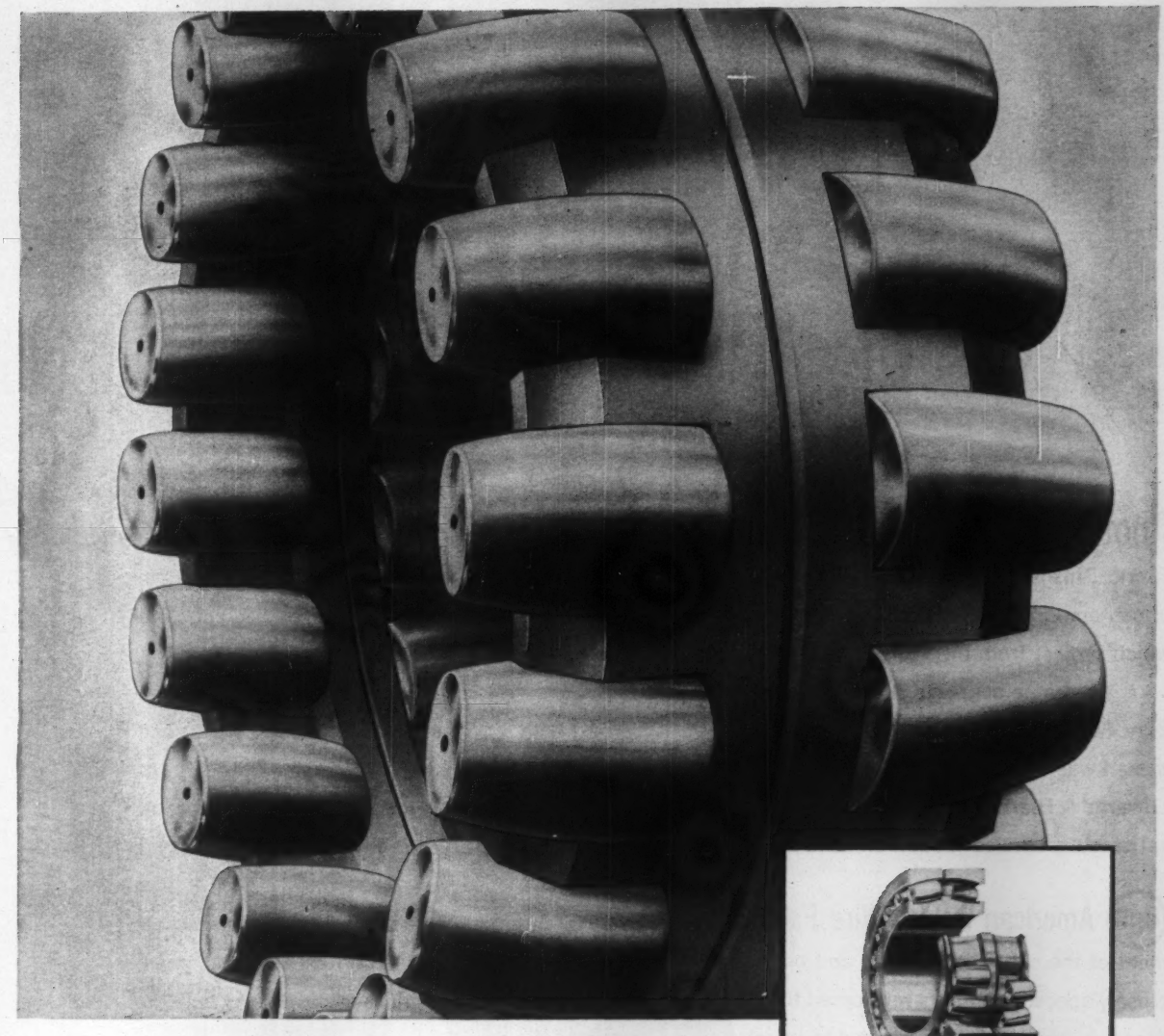
Briefs . . .

• **Plastic roof**—A new plastic roofing, weighing about 45 lb per 100 sq ft is suitable for flat and low pitched roofs. It comes in prefabricated panels or can be job-applied with a liquid plastic coating with quick hardener applied on fiber glass cloth stretched over sheeting board and covered with colored mineral granules. SHIELDCOAT INTERNATIONAL, INC., 30 W. WASHINGTON, CHICAGO 2, ILL.

• **Hoisting Units**—Electairlift line of hoisting units can lift scaffold units, climber baskets or power bosun's chairs. The line includes one manual, one pneumatic, and two electrically-powered models. OHIO HOIST MANUFACTURING CO., LISBON, OHIO.

• **Springless hinge**—A double-action hinge for swinging doors works without any spring. It opens at the touch of a hand and then closes itself automatically. It costs $2.50 per hinge. BECKER SPIRA-LIFT HINGE CO., INC., 11433 EAST GARVEY, EL MONTE, CALIF.

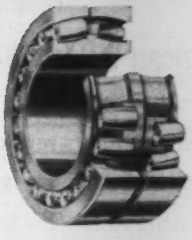
• **Rotary air compressor**—Diesel-powered rotary air compressor delivers 900 cfm, maintaining a minimum air pressure of 100 psi under all normal demand, according to the manufacturer. THE JAEGER MACHINE CO., COLUMBUS 16, OHIO.



"Caged" for Longer Life!

The two land-riding cages in Torrington Spherical Roller Bearings assure proper roller spacing and guidance, even under rugged conditions of shock load and sustained high speeds. These fully machined cast bronze cages operate independently. Their design eliminates drag on rollers. These high-strength cages help bearings give longer life by providing low friction, smooth running and cool operation. Highly effective and generous lubrication of all contact surfaces is achieved with the open-end cage design.

The result: Torrington Spherical Roller Bearings are built to give extra years of unmatched service life in heavy-duty applications. Torrington's long experience in design, engineering and manufacture of every basic type of anti-friction bearing provides the finest spherical roller bearings available. You'll find it pays to standardize on Torrington.



Superior design features of TORRINGTON SPHERICAL ROLLER BEARINGS

- integral guide flange for roller stability
- asymmetrical rollers seek flange for positive guidance
- electronically matched rollers
- size-stabilized races
- fully machined land-riding bronze cages
- controlled internal clearances
- even load distribution
- inherent self-alignment
- long service life

progress through precision **TORRINGTON BEARINGS**

THE TORRINGTON COMPANY South Bend 21, Indiana • Torrington, Conn.

Another New York skyscraper has been reinforced with USS American Welded Wire Fabric. This is Rockefeller Center's new forty-eight-story Time & Life Building, an outstanding example of contemporary architectural design. The exterior steel columns are encased in stone-faced concrete which project from the walls and serve to accent the vertical sweep of the tower.

The frame supports short span, lightweight concrete slabs reinforced with USS American Welded Wire Fabric. Each slab is 8'0" long and 4" thick. When asked why the fabric-reinforced short-span design was selected for this structure, W. B. Scofield, partner in the structural engineering firm of Edwards & Hjorth, said "This system provides first-class, fireproof construction with a long record of satisfactory service in addition to its proven economy, speed of construction, and occupancy flexibility."

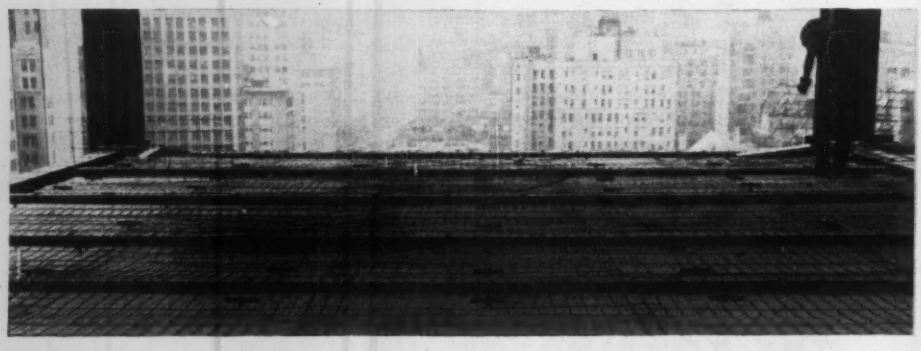
USS American Welded Wire Fabric was also used to reinforce the concrete fireproofing encasement of the columns, girders, and beams. Fabric is excellent for this application because the small, closely spaced members reinforced this thin concrete best. In addition, fabric is easily shaped to fit the contours and is sufficiently rigid to maintain the required shape.

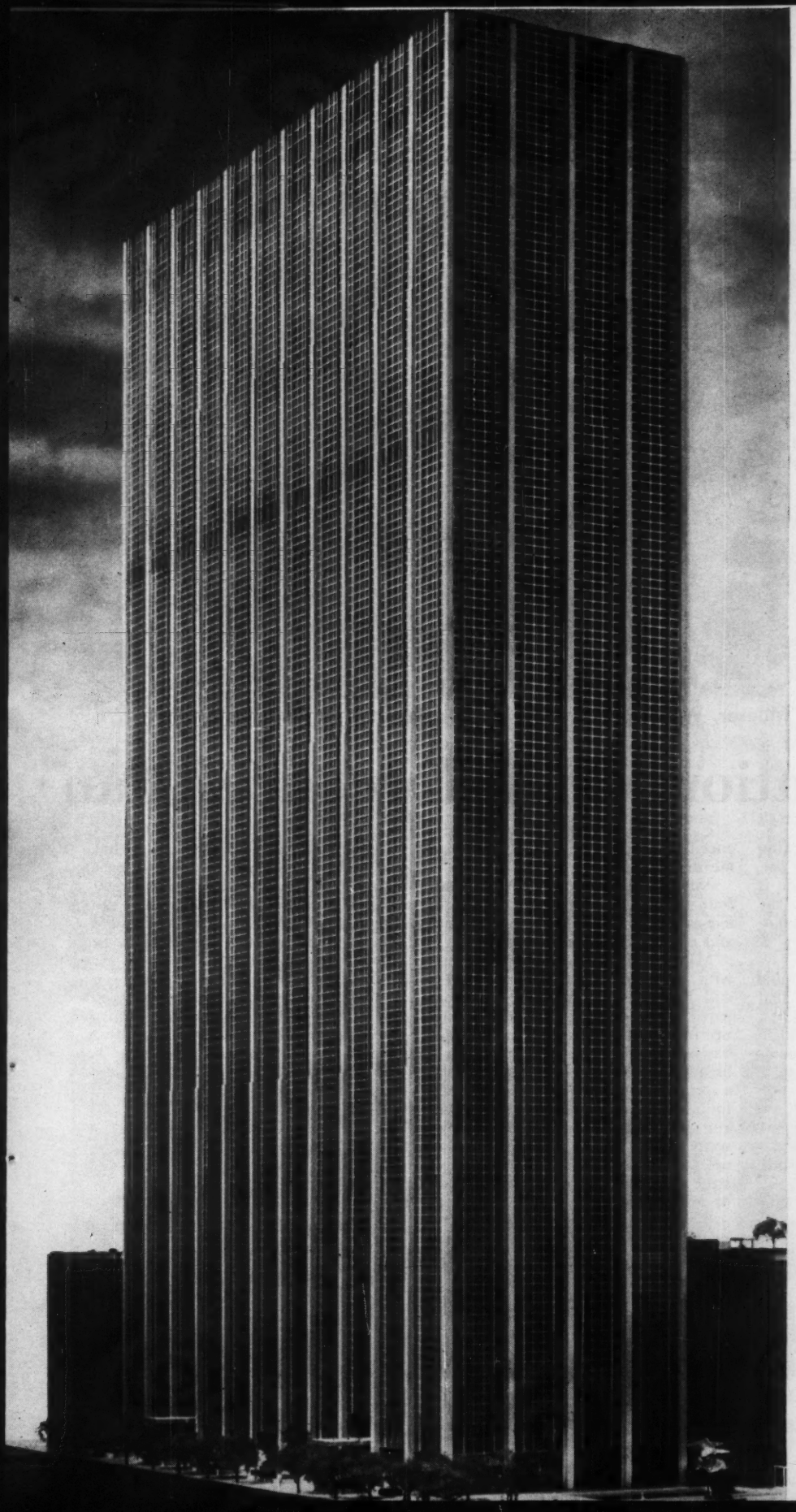
Please write American Steel & Wire, Dept. 0247, 614 Superior Avenue, N.W., Cleveland, Ohio or contact our nearest sales office for complete information on these or any other uses of USS American Welded Wire Fabric.

USS and American are registered trademarks

Short-span fabric-reinforced floor system in Rockefeller Center's Time & Life Building. American Welded Wire Fabric was furnished in long rolls and merely unrolled perpendicular to the beams and on top of the forms. It was draped from the top of the slab over the beams to the bottom of the slab at mid-span. Thus, the reinforcement is in position to best resist both positive and negative moments. The economy of steel placement is apparent. In total, over six million square feet of short-span slabs reinforced with Welded Wire Fabric have been used in New York's Rockefeller Center.

Owners: Rockefeller Center, Inc. and Time Inc.
Architects: Harrison & Abramovitz & Harris
Structural Engineers: Edwards & Hjorth
General Contractor: George A. Fuller Company
John Lowry, Inc.
Fabric Distributor: Fireproof Products, Inc.





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Distributors Abroad

All five partners—Rutledge, Mueser, Wentworth, Proctor and Johnston, l. to r.—agree on their

Foundations Are More Art Than

Every engineering art today is moving closer to the status of a science, but one that will never fully make the grade is foundation engineering. That is in the opinion of Carlton S. Proctor, senior partner, Moran, Proctor, Mueser & Rutledge.

Mr. Proctor speaks from a background of 41 years with a consulting firm that was fifty years old on May 1, and that has handled many of the nation's toughest foundation jobs, as well as some abroad, during that period (see also p. 43). His conviction stems not only from his own experience, but garners strength from the beliefs and accomplishments of the firm's founder, Daniel E. Moran, dean of American foundation experts during his professional lifetime, which extended from the middle 1880's until his death in July, 1937.

"You will find," Mr. Moran told Mr. Proctor when he joined the firm, "that foundation engineering is an art in which there is no substitute for judgment based on wide experience." Even after he had played a prominent role in the early development of the science of soil mechanics, Mr. Moran repeatedly expressed the conviction that this new science should be treated "only as a valuable tool to be used by the experienced foundation engineer, never as a means unto itself."

Not only Mr. Proctor, but the other four partners in the firm, as well as the five associates, still adhere to this belief, and conduct their practice accordingly.

MPM&R is not a large firm, indeed, with its payroll varying between 100 and 150, it is on the small side compared to some modern consulting engineering organizations. For one thing, it has never yielded to the temptation to broaden its activities, electing to remain a specialist in foundations including the foundation aspects of marine structures and earthdams. Now and then it has seemed to go farther afield, as on a tunnel, a masonry dam or a dock superstructure, but in each case foundations or geology were prominently involved.

The great bulk of the firm's practice relates to foundations of buildings, bridges and marine structures. As a result, architects and other engineering firms as well as the engineering divisions of governments and corporations are its chief clients. It also serves contractors engaged in heavy construction.

A recent compilation showed that the firm had handled 2,300 different commissions, large and small, during its fifty years of existence. Over the past decade its volume of work has increased so that the number of jobs per year now averages about 150, representing about $50 million of foundation construction. Assuming an average 4% fee, MPM&R's gross annual income would thus be about $2 million.

Now and then a single job has been in the $20 million class, but mostly they range much smaller. They also range through the whole band of consulting

Moran—Dean of U. S. foundation experts left a lasting legacy to the firm.

firm's 50th birthday that . . .

Science

services from preliminary reports to complete design and field supervision and inspection. Broadly speaking, however, most of the foundation work that MPM&R takes on is of the difficult and specialized variety, so that it has to go farther than the usual consulting engineer firm in working out complete construction procedures.

Here, too, it has a valuable legacy from its founder. Dan Moran, before he hung up his shingle as a consultant in 1910, had been chief engineer for General Sooy Smith, one of the great foundation experts of the nineteenth century, when engineers personally directed field construction operations. Subsequently, also, Mr. Moran was cofounder of The Foundation Company and chief engineer of this well known construction organization for ten years. During this period he invented and patented the Moran air lock and the type of pneumatic caisson that has a reinforced concrete working chamber integral with the caisson body. To a considerable extent it was this type of caisson that made possible the New York skyscrapers in Lower Manhattan and permitted bridge foundations to be carried to theretofore unattainable depths.

The firm's present tie with this past is close and continuous, for Carlton Proctor's 41-year connection, beginning soon after his graduation from Princeton, is nearly matched by William H. Mueser's 37 years which began after a year's graduate work at Berlin's Technische Hochschule following his graduation from MIT.

There is also still available the consulting advice of George L. Freeman, a former partner, who joined the firm in 1929 after long experience in heavy construction. The firm name, Moran & Proctor up to 1936, was Moran, Proctor & Freeman from 1936 to 1939, and Moran, Proctor, Freeman & Mueser from 1939 to 1951.

As the old pros in the organization, Proctor and Mueser set its pattern and its pace. Carlton Proctor is more the public figure, Bill Meuser the top-notch job administrator. And both are extremely capable engineers who work hard and conscientiously at their business. At the same time both have always found time to devote to professional activities through a large variety of engineering societies, and Mr. Proctor has risen to the top office in several of the most important and influential.

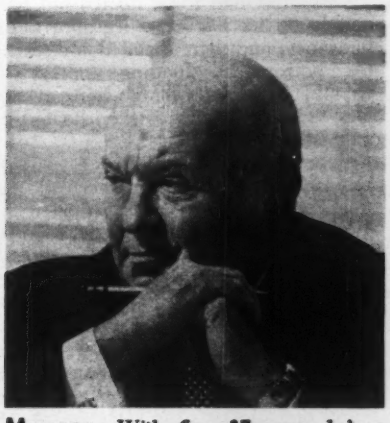
He has been president of the American Society of Civil Engineers, of the American Institute of Consulting Engineers and of the Princeton Engineering Society. He has also had the signal honor, for an engineer, of being elected president of The Moles, whose membership is largely made up of heavy construction contractors. As a colonel in the Corps of Engineers in World War II (he had been a captain in World War I), he took a special service regiment to Iran where he commanded the Desert District of the Persian Gulf Command that built the wharves as well as the roads, the truck assembly plants and other facilities that figured in the supply line to Russia.

After the war he headed the National Engineers Committee of Engineers Joint Council which developed the significant reports on the industrial disarmament of Germany and Japan.

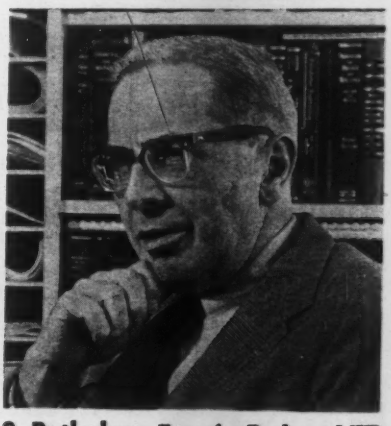
In contrast to Proctor and Mueser—as well as to 25-yr veteran Robert C. Johnston—who have spent all of their professional lives with the firm, the other two partners, Philip C. Rutledge and Paul M. Wentworth, joined MPM&R after extensive experience elsewhere. Phil Rutledge, who came with the firm in 1952, had been chairman of the department of civil engineering at Northwestern University for nine years, professor of civil engineering at Purdue for six years and before that had taught at both Harvard and MIT. Paul Wentworth, with MPM&R for 20 years, practiced as a structural engineer before joining the firm.

Among the associates there is prac-

Proctor—Senior partner speaks from 41 years experience with the firm.



Mueser—With firm 37 years, he's a widely known foundation expert.



& Rutledge—Ex-prof, Purdue, MIT, Harvard, Northwestern, joined up in 1952.

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tically the same pattern of either long tenure with the firm or extensive prior experience. James D. Parsons joined the firm back in 1940 and S. V. Di Simone in 1948.

The other three associates, Stanley J. Johnson, James P. Gould and Theodore M. Kuss, came to MPM&R about five years ago after prior experience ranging from 10 to 30 years. Johnson had been chief of the embankment and foundation branch at the Corps of Engineers' Vicksburg laboratory, Gould was a research and design engineer with the Bureau of Reclamation and Kuss had had his own consulting practice in San Francisco, which had been preceded by such top jobs as chief engineer of the Pacific Bridge Co. and vice president of Frederic R. Harris, Inc.

That an experienced staff focusing its attention on the specific target of difficult foundation problems and motivated by a legacy of accomplishment going back a half century can exert leadership in its field is demonstrated by the number of MPM&R jobs that have made significant contributions to advances in the art and science of foundation engineering. A dozen of these jobs are recalled in the article on page 43. Others could also be cited to illustrate how foundations problems have sometimes been so dominant that the firm has had to take an active part in the superstructure design.

There is, for example, the case of the Texas Towers, those huge radio platforms founded far offshore in the Atlantic Ocean. MPM&R, as the architect-engineer for the Navy, determined that the towers be designed for three leg support.

For the two shallow locations, legs and supported platforms were pre-assembled, towed out and sunk. For the third location, however, in 185 ft of water, MPM&R determined that the leg assembly had to be floated out separately on its side (two legs providing buoyancy) and then upended and set on the bottom by flooding appropriate chambers in the lower portions of the legs. The platform was then floated in and jacked up the legs.

Somewhat similarly the design of Drydock No. 6, largest in the world, at the Puget Sound Naval Shipyard in Washington, was dictated by foundation conditions. The site being on "made" land, requiring 600,000 cu yd of dredging and 1,200,000 cu yd of fill, was not suitable for driving piles. A fully-relieved type of dock was therefore designed in which an elaborate drainage system to moderate the ground water pressures was the key element.

Such jobs, says Bill Mueser, serve to emphasize the necessity for versatility on the part of foundation engineers as well as the usefulness of experience. They also, in his opinion, justify MPM&R's philosophy of trying always to have such capabilities available on its staff that no foundation problem is too difficult to tackle.

Carlton Proctor sees in the jobs that the firm has handled justification for a continuing belief that foundation engineering must remain always an art, but one that uses science as a tool to supplement and, when possible, to support decisions that are based on experience.

Significantly, a recent big job of MPM&R's first half century—foundations for the 60-story Chase Manhattan Bank in New York City—make the above Mueser-Proctor statements ring true. It was prior experience on other buildings in the area that paced the general plan of attack, but it was versatility and the knowledge of how to use science as a tool that permitted expensive, time-consuming pneumatic caissons to be abandoned in favor of chemical solidification (ENR July 24, 1958).

The Chase Manhattan job was a fitting climax to MPM&R's first half-century as it is a fitting beginning for the rest of the century that lies ahead.

Stone & Webster Names Construction Manager

William L. Sheets, vice president of Stone & Webster Engineering Corp., has been appointed senior construction manager of the world-wide engineering and construction organization.

Mr. Sheets received his civil engineering education at the University of Nebraska. He first joined Stone & Webster in 1929 as an instrument man and successively worked as resident engineer, project engineer and general superintendent on construction projects. He was named construction manager in 1955 and elected vice president in 1958.

Department of State Building—Washington, D. C.
Owner: General Service Administration
Architects & Engineers: Graham, Anderson, Probst & White, Inc.—Chicago
Harley, Ellington & Day, Inc.—Detroit
Associate Architect: A. R. Clas—Washington, D. C.
Gen. Contractor: John McShain, Inc.—Philadelphia

Keep Construction Costs DOWN with REINFORCED CONCRETE

Another outstanding example of reinforced concrete construction will be the new—soon to be completed—Department of State Building, Washington, D.C. Here the architects chose reinforced concrete flat slab construction because of its low cost. With the head room gained, architects were able to provide more stories without exceeding building heights of older buildings in the area, and to use to advantage a 31-foot grade variation to provide parking facilities for 700 vehicles. Before you begin design or construction of any new building, be sure to investigate this more economical and flexible building method.

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8-6

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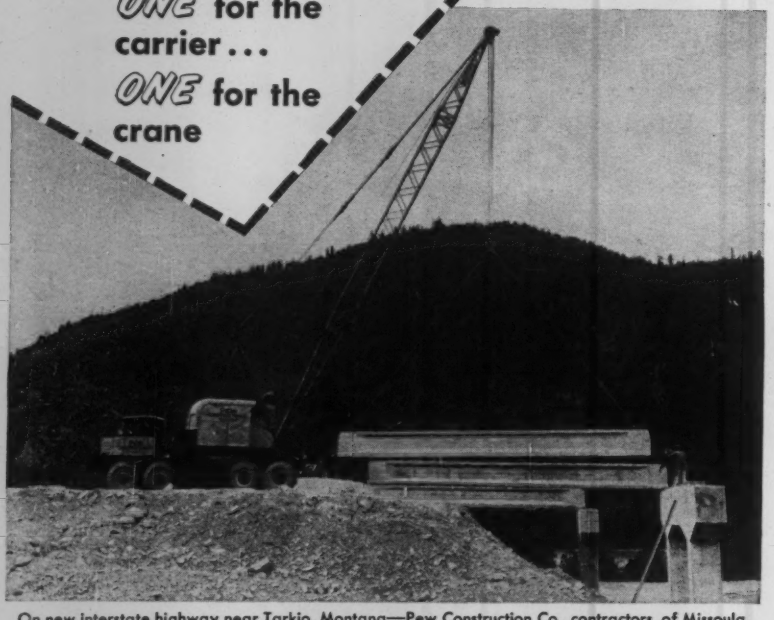
ONE for the carrier...
ONE for the crane



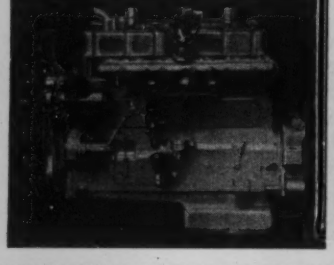
On new interstate highway near Tarkio, Montana—Pew Construction Co., contractors, of Missoula, Montana, are building overpasses for the Montana Highway Department, using an MC-530W Lorain truck-crane with two Waukesha Engines.

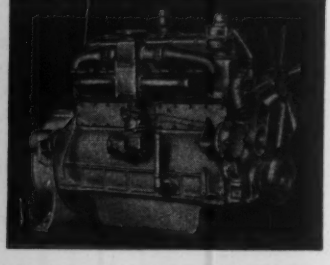
Setting prestressed concrete beams—40 to 45 ft. long, weighing 10½ to 12½ tons each — constructing highway-over-highway overpasses! And, lifting these beams on a radius of 32 ft., with a 65 ft. beam, the Lorain truck-crane did the job handily. Its crane engine, a Waukesha gasoline 135-GZB, has the sheer lifting power, and the quickly responsive, smooth power for maneuvering, with reserve power when needed. The carrier engine, a Waukesha gasoline 145-GKB, "has lots of power for the road" says the crane operator.

Send for Engine Bulletins.

Powering the Carrier—145-GKB
Waukesha Gasoline, 5¼-in bore x 6-in. stroke, 779 cu. in. displacement. Max. hp 240 @ 2400 rpm.

Powering Crane (boom) 135-GZB
Waukesha Gasoline, 4⅜-in. bore x 5-in. stroke, 451 cu. in. displacement. Max. hp 153 @ 2800 rpm.





WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN
NEW YORK TULSA LOS ANGELES
Factories — Waukesha, Wisconsin, and Clinton, Iowa 485

. . . Men and Jobs

Careers

Walter E. Robey, formerly assistant bridge engineer of the Santa Fe Railway System, is promoted to bridge engineer, succeeding **Clifford H. Sandberg,** who becomes chief engineer for the eastern lines at Topeka, Kan. Mr. Sandberg succeeds **Harold E. Wilson,** who is now assistant chief engineer of the railway system.

Whitehead & Kales Co., a Detroit structural steel firm, has elected **Harold P. Powell** to the board of directors. He has been treasurer since 1956.

Vaughn Marker has been promoted to managing engineer of the Pacific Coast Division, The Asphalt Institute. Mr. Marker succeeds **B. A. Vallerga,** who has taken a position with Golden Bear Oil Co.

Angus D. Henderson has formed Angus D. Henderson, Consulting Engineers, Westbury, N. Y., with the admission of **Thomas J. Casey** as partner. Mr. Casey was formerly with Ford, Bacon & Davis, Inc., New York City.

Charles E. DeAngelis has been appointed assistant to the vice president of sales of Walter Kidde Constructors, Inc., of New York City and Belleville, N. J.

Theron (Ted) Bean has joined Hawaiian Dredging & Construction Co., Ltd., Hawaii, as consultant. Mr. Bean has been chief estimator for Bechtel Corp. in San Francisco for the last ten years.

Robert W. Dickerson and **Howard B. Cain,** Cleveland architects, have announced the merger of their practices as Dickerson & Cain, Architects.

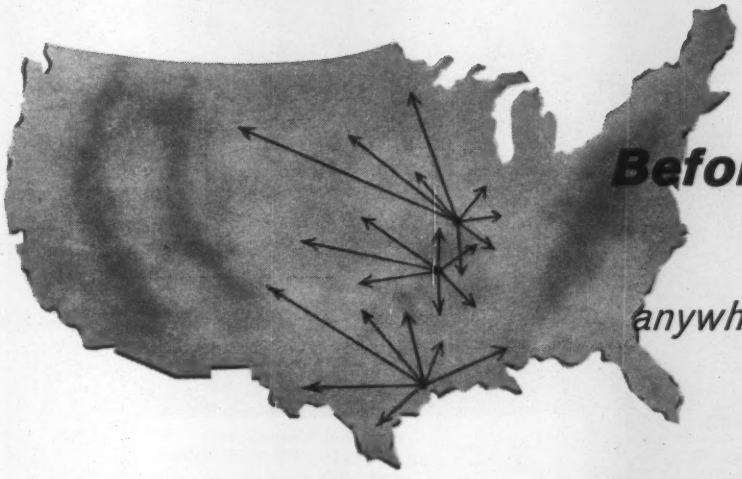
Kral Zepf & Associates, Cincinnati architectural and engineering firm, announces the appointment of three associates: **Milton G. Weust, John E. White** and **Earl L. Paul.** Former partner **Rowland C. Kleine** has joined the staff of the Turner Construction Co. in Cincinnati.

Cincinnati architects Harry Hake and Harry Hake, Jr., have appointed **Harry Hake III, Joseph M. Lyle, Robert K. Haupt, Cavin D. Gray, George B. Hampton** and **William C. Forbes** as associates in a major expansion move of their organization.

W. B. Nern, of Wheeling Corrugating Co., Wheeling, W. Va., is the new president of the National Corrugated Metal Pipe Association.

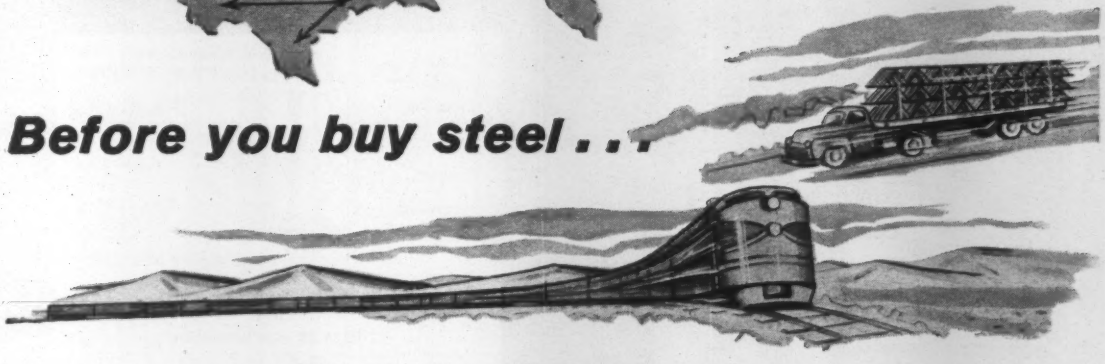
R. W. Neilson, director of public works for the city of Winston-Salem, N. C., has been elected president of the North Carolina Chapter of the American Public Works Association.

Wyoming Practicing Engineers and Surveyors elected **John Lambert** of Douglas, Wyo., president for the 1960 term.



Before you bid on construction

anywhere in the Midwest



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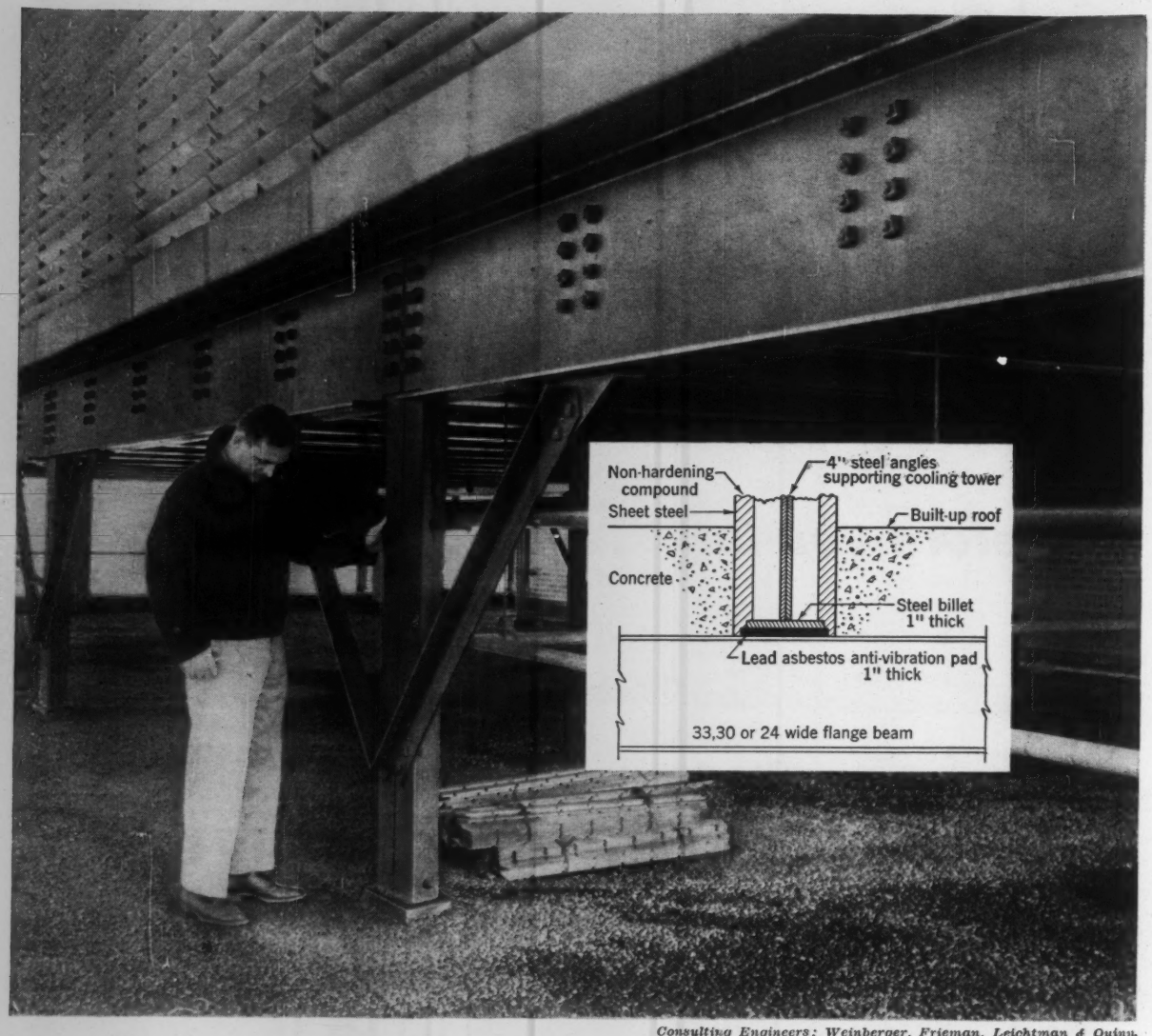

Consulting Engineers: Weinberger, Frieman, Leichtman & Quinn
Architects: Sylvan Bien & Robert L. Bien

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Occupants of the new 35-story skyscraper at 575 Lexington Avenue in New York stay cool all summer, thanks to a 205,000 pound air-conditioning unit located on the roof. And, because of the lead asbestos pads beneath it, they stay comfortably cool . . . noise and vibration are isolated to the tower.

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LOOK AHEAD WITH LEAD

Obituaries

Richard M. Wood, 60, construction manager with Stone & Webster Engineering Corp., New York City. He had directed the construction activities for many of the consulting firm's utility clients, including Western Massachusetts Electric Co., Montaup Electric Co. and the Hydroelectric Power Commission of Ontario.

Ernest R. Molt, 77, chairman of the board of Edward Balf Co., Hartford paving contractor, and sand, gravel, concrete and trap rock firm.

Albert C. Richards, retired structural design engineer in the bridge engineering division of the department of public works for New York State.

Herman Orr, a senior engineer with the Office of the Chief of Army Engineers, Washington, D. C. Mr. Orr had been chief of the construction evaluation section, military construction division.

George H. Kraus, 58, president of Kendall Roadways Inc., Buffalo, N. Y. He had been prominent in the Buffalo contracting field for many years, heading several companies during the past 25 years.

Matthew A. Lemish, 59, a Miami Beach, Fla., contractor and builder. His most recent work was the 12-story Southgate Towers Hotel in Miami Beach.

S. L. Hurt, 62, Miami Beach engineer and builder. He had been in business with his father and brother in Atlanta and then Miami Beach.

Anton Albert Anderson, 67, retired assistant chief engineer for the Alaska Railroad. He had been Mayor of Anchorage from 1952 until illness forced his retirement last year.

Carl P. Richards, 78, retired civil engineer and noted amateur astronomer. He served 20 years in the highway department of Oregon.

William Charles Clark, retired professional engineer in Cleveland. He had been associated with the architectural firms of Knox & Elliot and J. Milton Dyer in the planning of office and industrial buildings.

Albert P. Croll, 74, president of A. P. Croll & Son, general contractors of Georgetown, Del. Mr. Croll's firm has had part in some of Delaware's major construction including the Dover Air Force Base.

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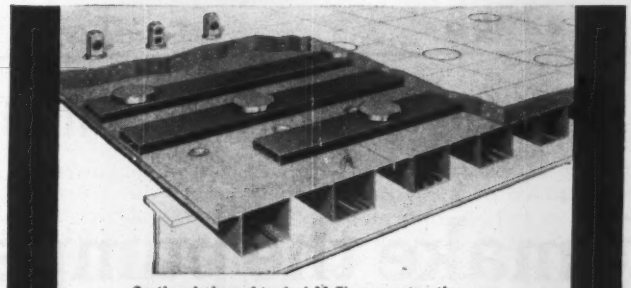

Sectional view of typical M-Floor construction: This electrified steel cellular floor, using M2-4.5 sections, is energized from a three-header duct electrical distribution system. M-Floor installation is easy—electrical wiring is quick.

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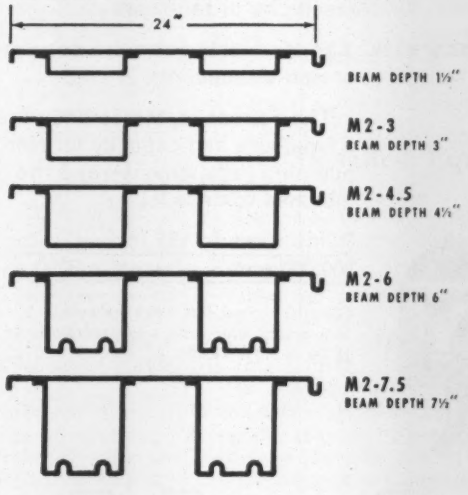

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- Steel Roof Deck
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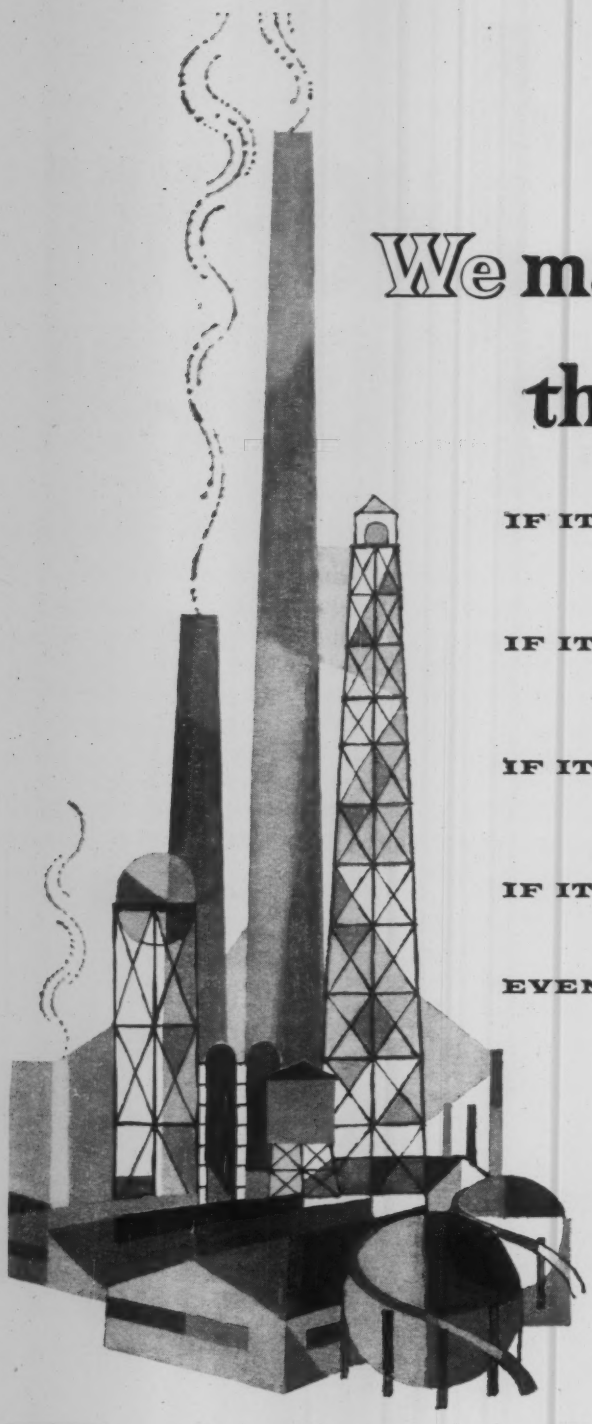

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Mr. Fuller's Strange World

THE DYMAXION WORLD OF BUCKMINSTER FULLER—By Robert W. Marks. 232 pages. Reinhold Publishing Corp., New York, N. Y. $12.00.

This book will be of interest to those who would like to learn something about Buckminster Fuller, inventor of that machine for living, the Dymaxion House. It probably will be no more helpful than previous biographies, or Mr. Fuller himself, in clarifying his philosophies or justifying his unusual structures.

In recent years, Mr. Fuller has gained fame for his promotional efforts on behalf of trussed domes, which he calls geodesics. But at one time, he also attracted world-wide attention for his invention of a radical three-wheeled automobile, as well as the unconventional, cylindrical metal house suspended from a central mast. He studied engineering at college, the author recalls, but youthful sowing of wild oats led to premature departure from a couple of institutes of higher education.

How much more successful Mr. Fuller could have been in construction if he had the knack of expressing his concepts clearly to ordinary mortals is open to surmise. But as can be seen from quotations in this book, he combines syllables into words and words into sentences that probably are intelligible only to himself and a few disciples. If he does have grounds for his theories, this book fails to reveal them.

Mr. Fuller, as the author says, is a nonconformist. He generates unconventional ideas. Some of these have led to strange structures, such as the type he has named tensegrity—a grouping of tension and compression members, in which the compression members are not interconnected. Mostly, he designs and builds space framing, a type of construction that most structural engineers have sadly neglected.

Not all of Mr. Fuller's ideas may have practical applications at the moment. But they have inspired others in the past to put them to use and surely they will continue to do so. Someday, perhaps, the tensegrity concept may be applied to structures in outer space, where lack of gravity makes posts less important than ties.

Spectrum of Highway Engineering

HIGHWAY ENGINEERING HANDBOOK, Edited by Kenneth B. Woods, 1,696 pages. McGraw-Hill Book Co., New York. $25.00.

This handbook covers the field from financing, planning, and traffic operations to design, construction, maintenance, and landscaping. In 28 sections prepared by 47 leading authorities, it treats such topics as route selection and layout, finance and administration, soil mechanics, testing, highway materials, basic highway design, rigid and flexible pavements and other important facets of the subject.

Chief editor is Kenneth B. Woods, currently head of the School of Engineering, Purdue University.

Special features include material on the design of pavements to resist slipperiness, the distribution of soils in North America, frost and permafrost as it affects highway design, and photogrammetric techniques. The book is designed so that all information is easy to find; the discussions are well illustrated and up to date.

Also covered: urban transportation planning; the use of digital computers; acquisition of rights-of-way; seismic and resistivity techniques; design of foundations, embankments, and cut slopes; drainage for highways and airports; contracts and specifications; distribution, production and engineering characteristics of aggregates; soil stabilization; and many other subjects.

Costs: Installed Equipment

MECHANICAL ESTIMATOR'S GUIDE—1960 Edition, John Gladstone, Editor, 56 pages, 8½ x 11 in. Technical Guide Publications, Inc., Miami, Fla. $6.

Tables are presented to show unit costs in dollars for mechanical equipment installed. Major emphasis is on air conditioning.

The labor prices used are based on union-scale national averages ($3.49 plus fringe benefits of 19¢ per hour) and the maximum allowable ratio of apprentices to journeymen. Contingencies, job profit and overhead allowances are left to the judgment of the individual estimator.

Cost per nominal ton are shown for ranges of sizes of air-conditioning units; a few actual costs of complete systems are given with ratio costs of components and cost per ton and per sq ft of building; also the number of sq ft per ton of air conditioning capacity.

Brief Reviews

LAND SUBSIDANCE IN SAN JOAQUIN VALLEY, CALIFORNIA—A report of the Inter-Agency Committee on Land Subsidence. Copies of the committee's report are on file at libraries and public information offices of the U. S. Geological Survey, State Geological Surveys, regional offices of the Bureau of Reclamation, libraries of major colleges and universities in all states, and the California Department of Water Resources and the Division of Highways.

FLOOD CONTROL IN THE LOWER MISSISSIPPI RIVER VALLEY—Pamphlet covers description of river's lower alluvial valley and its drainage basin, with discussion of early flood control works, beginning in 1717, and discusses present flood control plan begun after basic Flood Control Act of 1928. Mississippi River Commission, P. O. Box 80, Vicksburg, Miss. Free.

FLOOD CONTROL AND NAVIGATION MAPS OF THE MISSISSIPPI RIVER—1959 edition of the map folio contains an index of maps and 62 maps covering the lower Mississippi River from Cairo, Ill., to the Gulf of Mexico. Mississippi River Commission, Vicksburg, Miss., or the U. S. Army Engineer District in St. Louis, Memphis, Vicksburg, or New Orleans. $2.25.

SEQUENCE AND TIMING IN RIVER BASIN DEVELOPMENT—This 40-page booklet, by John V. Krutilla, deals with economic analysis in river basin planning and project evaluation. Resources for the Future, Inc., 1145 Nineteenth Street, N.W., Washington 6, D. C. 75 cents.

NAVIGATION CONDITIONS AT JACKSON LOCK AND DAM, TOMBIGBEE RIVER, ALABAMA—The report describes the high-lift Jackson lock to be located in the right bank about 600 ft landward of the river's edge. Technical Report No. 2-532, U. S. Army Engineer Waterways Experiment Station, Vicksburg, Miss. 75 cents.

SPILLWAYS AND STILLING BASINS, JACKSON DAM, TOMBIGBEE RIVER, ALABAMA—Report describes the performance of gated and fixed-crest spillways and stilling basins as studied on two 1:50 and 1:35-scale section models. Technical Report No. 2-531. U. S. Army Engineer Waterways Experiment Station, Vicksburg, Miss. 50 cents.

TIDAL FLOW IN ENTRANCES—Two analytical studies consider entrances to a canal connecting an ocean with a lagoon or bay and jet flow from a channel into a region surrounding quiet water. U. S. Army Engineer Waterways Experiment Station, Vicksburg, Miss. 75 cents.

DEVELOPMENT OF HYDRO POWER STATIONS ON THE DANUBE—A nine-page booklet describes existing stations and those under construction or projected. Prepared by the Secretariat of the Economic Commission for Europe. Copies obtainable from Columbia University Press, New York, N. Y. 15 cents.

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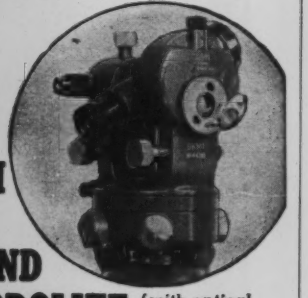

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HIGHWAY BRIDGE VIBRATIONS—Part 1: A Review of Previous Studies—Report No. 4. Queen's University, Kingston, Ont., Canada.

COORDINATED SCHOOL AND COMMUNITY PLANNING—The School Planning Laboratory, School of Education, Stanford University, Stanford, Calif. $2.50.

CHEMICAL PROCESSING OF IRRADIATED FUELS—TID-7583. Office of Technical Services, Department of Commerce, Washington 25, D. C. $4.50.

CONTINUITY IN CONCRETE BUILDING FRAMES—Fourth edition. Portland Cement Association, 33 W. Grand Ave., Chicago 10, Ill.

METHODS OF REDUCING THE COST OF PUBLIC HOUSING—Plastics Merchandising Department, Dow Chemical Co., Midland, Mich.

A.C.I. STANDARD DESIGNATIONS AND CHEMICAL COMPOSITION RANGES FOR HEAT AND CORROSION RESISTANT CASTINGS—Alloy Costing Institute, 1001 Franklin Ave., Garden City, N. Y.

ROOF SHEATHING OF ⅜" PLYWOOD GRAIN PARALLEL TO SUPPORTS—by Noel R. Adams. Technical Department, Douglas Fir Plywood Association, Tacoma 2, Wash.

FUNDAMENTALS OF BUILDING INSULATION —Insulation Board Institute, 111 W. Washington St., Chicago 2, Ill.

MOLYBDENUM SPECIFICATIONS MILL PRODUCTS—Refractomet Division, Universal-Cyclops Steel Corp., Bridgeville, Pa.

RESEARCH STUDY IN THE COST OF HOUSING—State of New York, Division of Housing, 270 Broadway, New York 7, N. Y.

AMERICAN STANDARD METHODS OF DETERMINING AREAS IN HOSPITALS AND RELATED FACILITIES—Z65.4-1959. American Standards Association, Dept. PR129, 10 E. 40th St., New York 16, N. Y. 50¢.

HEAVY TIMBER CONSTRUCTION DEFINITION—American Institute of Timber Construction, 1757 K St., N. W., Washington 6, D. C.

PROCEEDINGS OF THE 1959 SYMPOSIUM ON LOW-TEMPERATURE NUCLEAR PROCESS HEAT—TID-7580. Office of Technical Services, U.S. Dept. of Commerce, Washington 25, D. C. 75¢

SEQUENCE AND TIMING IN RIVER BASIN DEVELOPMENT—Resources for the Future, Inc., 1145 Nineteenth St., N. W., Washington 6, D. C. 75¢.

CONCRETE CURTAIN WALLS—Portland Cement Association, 33 W. Grand Ave., Chicago 10, Ill.

DEFLECTION OF SAWN BEAMS (AITC-Sa 11.03)—American Institute of Timber Construction, 1757 K St., N. W., Washington 6, D. C.

MINERAL WOOL INSULATION AND THE ALL WEATHER COMFORT STANDARD—National Mineral Wool Association, 1270 Sixth Ave., New York 20, N. Y.

FLOODS IN OHIO, MAGNITUDE AND FREQUENCY—by W. P. Cross and E. E. Webber, 325 pages. Bulletin 32. Division of Water, 1562 W. First Ave., Columbus 12, Ohio. $5.00.

RADIOISOTOPES IN SCIENCE AND INDUSTRY —Superintendent of Documents, Government Printing Office Washington 25, D. C. $1.25.

EXPERIMENTAL CONTINUOUSLY-REINFORCED CONCRETE PAVEMENTS: PROGRESS REPORTS—1959—Bulletin 238. Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. $2.00.

BUILDING RESEARCH, INTERNATIONAL—Printing and Publishing Office, National Academy of Sciences-National Research Council, Washington 25, D. C. $1.50.

UNIFORM NOMENCLATURE AND SPECIFICATIONS FOR HARDBOARD—Hardboard Association, 205 W. Wacker Drive, Chicago 6, Ill.

HIGHWAY LAWS 1959—Bulletin 237. Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. 60¢.

CATHODIC PROTECTION AS APPLIED TO UNDERGROUND METAL STRUCTURES—Report 32. Building Research Advisory Board, 2101 Constitution Ave., Washington 25, D. C. $1.50.

AIR CONDITIONING DESIGN—Report 35. Building Research Advisory Board, 2101 Constitution Ave., Washington 25, D. C. $1.50.

UNDERFLOOR DUCT DISTRIBUTION SYSTEMS—Report 755. Printing and Publication Office, National Academy of Sciences-National Research Council, 2101 Constitution Ave., Washington 25, D. C. $1.00.

HIGH TEMPERATURE WATER FOR HEATING AND LIGHT PROCESS LOADS—Report 753. Printing and Publication Office, National Academy of Sciences—National Research Council, 2101 Constitution Ave., Washington 25, D. C. $2.00.

THE ROLE OF THE CONSULTING ENGINEER IN FEDERAL PUBLIC WORKS PROJECTS—144 pages. National Society of Professional Engineers, 2029 K St., N. W., Washington 6, D. C. Non-members $3.00; members $1.50.

STATE HIGHWAY ORGANIZATION CHARTS 1959 REVISION—Report 53. Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. $1.60.

INSPECTION OF PRESTRESSED CONCRETE—Prestressed Concrete Institute, 205 W. Wacker Drive, Chicago 6, Ill. $1.00; PCI members 50¢.

DESIGN: DATA BOOK FOR CIVIL ENGINEERS—Third edition, by Elwyn E. Seelye. John Wiley & Sons, Inc., 440 Park Ave., New York 16, N. Y. $24.00.

NUCLEAR POWER PLANT—By E. Openshaw Taylor, 184 pages. Philosophical Library, Inc., 15 E. 40th St., New York 16, N. Y. $7.50.

ELECTRICAL EFFICIENCY IN INDUSTRIAL PLANTS—By Edwin S. Lincoln, 235 pages. F. W. Dodge Corp., 119 W. 40th St., New York 18, N. Y. $9.50.

HYDROLOGY—Second edition, by Chester O. Wisler and Ernest F. Brater, 408 pages. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. $9.25.

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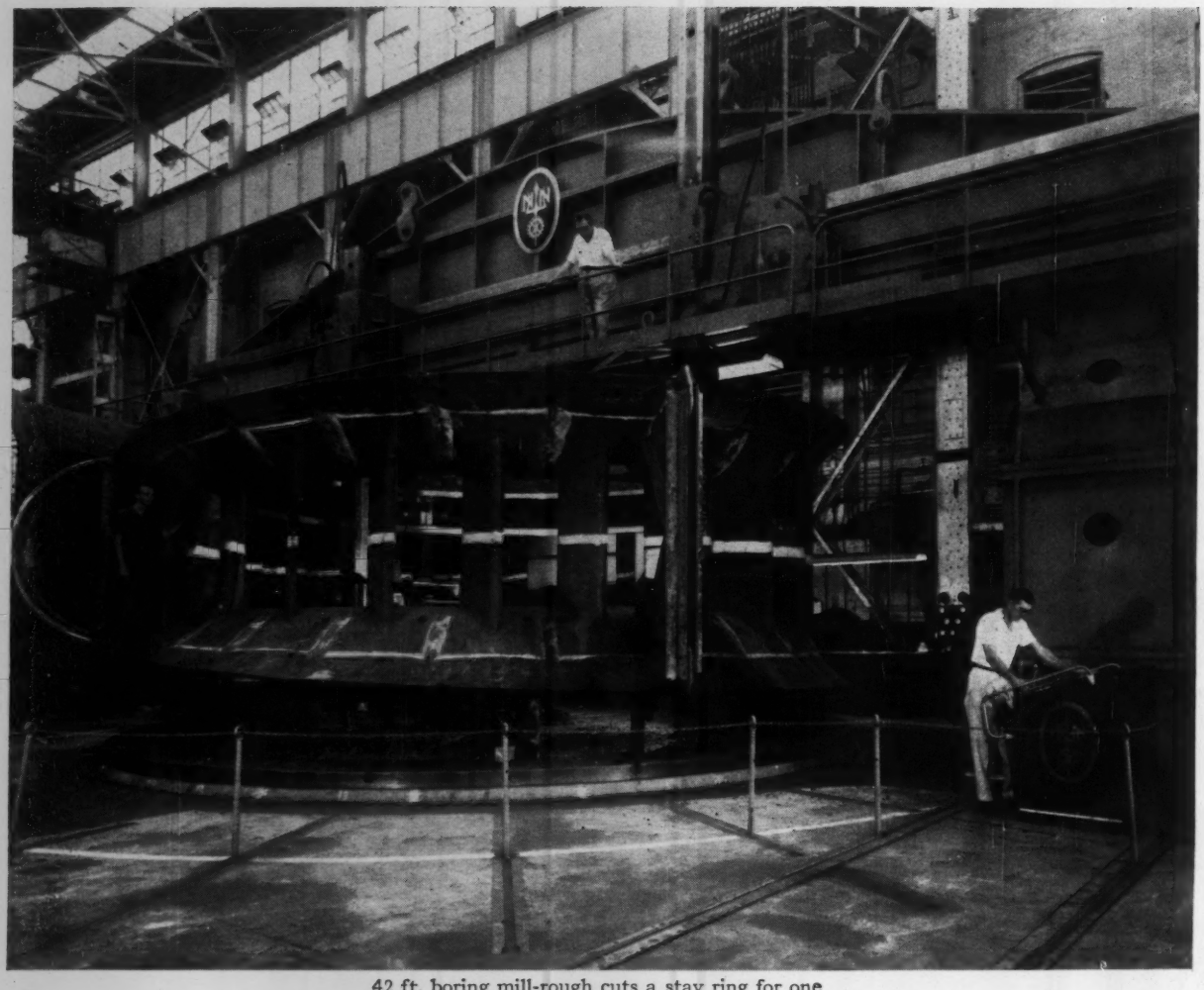

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Performance Up to Contractor

A contractor who seeks to recover a balance due under a contract that he has not completed has the burden of proving substantial performance.

The mechanics of the rule are illustrated by a federal case involving construction of a Public Housing Administration apartment project in New Orleans.

Prime contractor was R. F. Ball Construction Co., Inc. The contract price was $11 million.

Ball subcontracted the painting work to Clyde O. Williams and Hoke S. Brantley for $268,000. After the subcontractor had performed a substantial part of the work and had received advanced payments in the amount of $179,625, the prime contractor became dissatisfied with the painting work and ordered the subcontractor off the job and undertook to complete the painting work itself.

The subcontractor claimed it had completed 97% of the work and brought an action to recover the balance of $86,000 plus alleged extra work amounting to another $30,000. The prime contractor brought a separate action to recover the amount it claimed it cost to complete the work. Both actions were combined. The prime contractor's action was brought to recover the amount it spent in excess of the contract price to complete the work. The cases were tried by a jury which brought in a verdict in favor of the prime contractor in the amount of $15,000. This was reduced to $11,630. The judgment was affirmed on appeal.[1]

The court held that in an action by a subcontractor against a prime contractor for the unpaid balance on a contract and for extras, the subcontractor is the one who has to prove that he substantially performed the contract. He is not entitled to the unpaid balance and to the cost of extras unless he can prove substantial performance and the cost of the extras.

The question of whether the subcontractor sustained the burden of proof and the question of whether the prime contractor finished the work for less than the unpaid balance, are matters of fact for the jury to determine, the court said.

(1) Williams v. National Surety Corporation, 257 F.21d 771, U.S. Court of Appeals, Fifth Circuit, June 30, 1958.

Court Discusses Expert Witness

The qualification of expert witnesses is within the discretion of the court and will not be reviewed unless there is a showing that the discretion has been abused.

The point came up in a recent Rhode Island case that arose on a construction contract. The facts were these:

A contract was entered into for the erection of a garage.

The owner brought an action for breach of contract, contending that the contractor had abandoned the work and that the owner had to complete it.

The contractor later brought an action to recover for an alleged balance due under the contract, contending that it had substantially performed the contract. Both actions were consolidated and tried at the same time.

The trial court found that the contractor had not substantially performed and brought in a verdict in favor of the owner.

An appeal was taken from this judgment. One of the points raised on the appeal was that the court had improperly permitted the owner to testify as to the value of the work done to complete the job.

As to this phase of the litigation, the appellate court stated: "It is well established that the qualification of expert witnesses is within the discretion of a trial justice and that this court will review an exercise of such discretion only for abuse. Baffoni v. Baffoni, 77 R. I. 232, 74 A. 2d 857. We think the rule stated is applicable in any case in which the qualification of a witness to testify to matters within his knowledge is questioned. A trial justice does not abuse his discretion merely because he permits a witness to testify whose qualifications have not been shown to be extraordinary or superlative. Loughran v. Del-Santo, 79 R. I. 150, 85 A. 2d 66. In the instant case the witnesses were permitted to testify as to the value of services rendered by themselves in a field of work in which they had some experience. These exceptions of the contractors are overruled."[1]

(1) Rossilli v. Iacovelli, 149 A. 2d 709, Supreme Court of Rhode Island, March 31, 1959.

Court Will Not Require A Useless Performance

A person suing to recover on a contract should not be required to perform a useless act.

The rule was applied by a New York court under the following circumstances:

A contract for the sale of a house required a $4,000 deposit and warranted that the cellar of the premises would be free from seepage of water for a period of three months from the date of delivery of title.

A few days before the closing of title, water seepage was discovered in the cellar. The seller insisted upon the closing of title. Upon the refusal of the buyer to do so until proper steps were taken to stop the seepage in the cellar, the seller sold the house to another party on the same terms.

The original buyer brought an action to recover the down payment together with interest and obtained a judgment.[1]

The evidence produced at the trial showed that the seepage resulted from defective construction and the court concluded that since the sellers were unable to deliver a house with a cellar "free from seepage of water," it was in default of its contract.

The court stated: "It would be a useless and foolish act for plaintiff (purchaser) to take title, commit himself to a mortgage, pay the defendants (sellers) the balance in cash and then sue for a breach of warranty when he knew before the closing date that the defendants could not perform by delivery of a house with a cellar free from seepage. Thus, even on the theory of warranty, the principle to be followed is as stated in the Restatement of the Law of Contracts, Section 306 comment (a): 'No man is compelled to do a useless act, and if performance of a condition will not be followed by performance of the promise which is conditional, it is useless for the intended purpose and is, therefore, unnecessary to perform the condition'."

(1) Terner v. Goldwasser, 177 N.Y.S. 2d 195, Supreme Court, Nassau County, New York, June 16, 1958.

These summaries of court decisions are prepared by I. Vernon Werbin, Esq., New York attorney and licensed professional engineer, who is author of the following books published by McGraw-Hill Book Company, Inc.: *Legal Phases of Construction Contracts; Legal Guide for Contractors, Architects and Engineers; and Legal Cases for Contractors, Architects and Engineers.*

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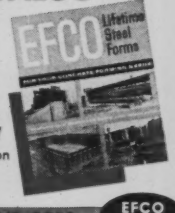

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Third Party Rights Are Limited

The extent to which third parties may recover damages against a contractor is sometimes limited by the terms of the contract.

In a New York case, for example, an action was brought by a property owner against a contractor based on a contract within the state. The property owner contended that the contract gave him the right to sue for damages that resulted from the contractor's work.

The contract contained the following provision: "All damage, direct or indirect, of whatever nature resulting from the performance of the work or resulting to the work during its progress from whatever cause, including omissions and supervisory acts of the State, shall be borne and sustained by the Contractor, and all work shall be solely at his risk until it has been fully inspected and accepted by the State. The Contractor, however, shall not be responsible for damages resulting from faulty designs as shown by the plans and specifications nor the damages resulting from wilful acts of Department officials or employees, *and nothing in this contract shall create or give to third parties any claim or right of action against the Contractor or the State beyond such as may legally exist irrespective of this paragraph or contract.*"

The contractor asked the court to dismiss the action on the ground that the clause in question clearly barred any right of action by a third party. The application was granted and the action was dismissed.

[1] The court conceded that if it were not for the underlined part of the clause of the contract, under the decision in the case of Coley v. Cohen, 289 N.Y. 365, 42 N.E. 2d 913, the property owner would have had a right of action under the contract against the contractor for any damage that he sustained as a result of the work. The court stated that "the underlined portion of the clause completely negates any third-party rights or claims other than those existing outside the contract."

(1) Costa v. Callanan Road Improvement Co., 184 N.Y.S. 2d 534, N.Y. Supreme Court, Dec. 15, 1958.

Joint Ownership Upsets Lien

Where a plot of land is owned jointly by a husband and a wife, and the husband contracts for the erection of a building, the contractor has no right to a lien unless there is proof that the husband was acting as agent for his wife.

In a Maryland case, for example, a husband entered into a contract for the construction of a house on a piece of unimproved land he and his wife owned.

The contractor, because of financial difficulties, quit the job before it was finished and the husband took over its completion. The wife took no part in planning the house or selecting or ordering materials, and her husband never conferred with her about such matters. The builders who had erected the house conceded that its dealings were solely with the husband.

The builder failed to pay a materialman. The materialman filed a mechanc's lien against the property.

The action to foreclose the lien was dismissed by the trial court and the judgment was affirmed on appeal.[1]

The appellate court held that the relationship of principal and agent between a husband and wife may not be implied from the marital status of the parties.

The appellate court further held, that mere knowledge of a wife, without more, that her husband is constructing a building on, or making improvements to, property owned by them as tenants by the entireties is not sufficient to establish that the husband is the wife's agent, nor does her mere failure to interpose an objection to the construction or improvements imply an intention by her that her interest in the property shall be bound.

(1) William Penn Supply Co. v. Watterson, 146 A. 2d 420, Court of Appeals of Maryland, Nov. 24, 1958.

Courts Are Not Concerned With Merits of Contract

A person who enters into a foolish or improvident contract cannot expect a court to relieve him from the burdens of the agreement.

Construction contracts, for example, often contain improvident provisions. A contractor may agree to make no claim for damages resulting from delays or acts of other contractors on the job. While such provisions may create a hardship, they are part of the contract and will be enforced.

The principle was applied in a New York case,[1] where a dispute arose over a

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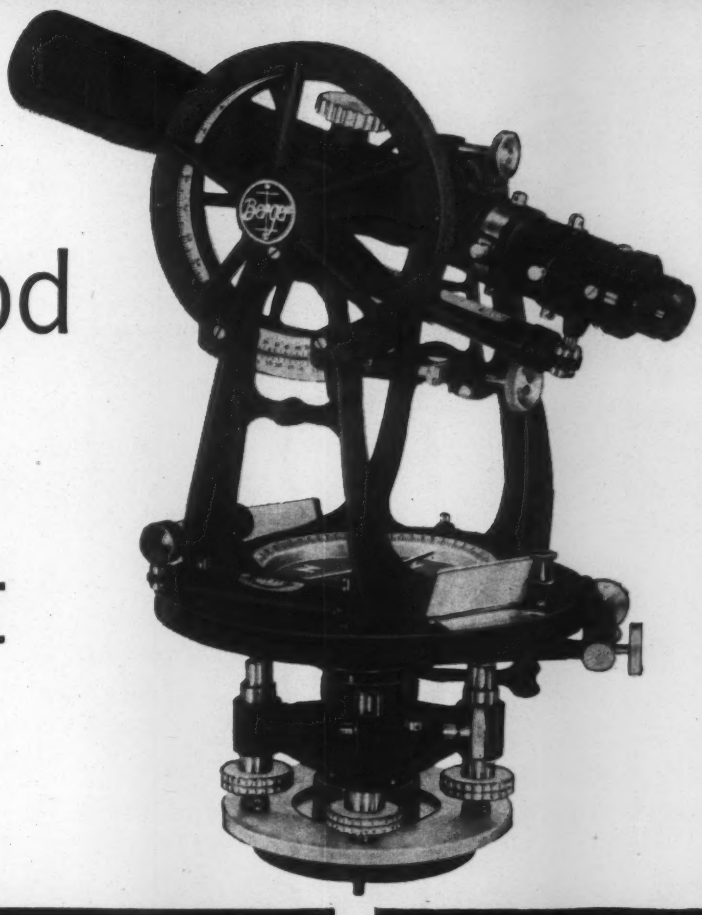

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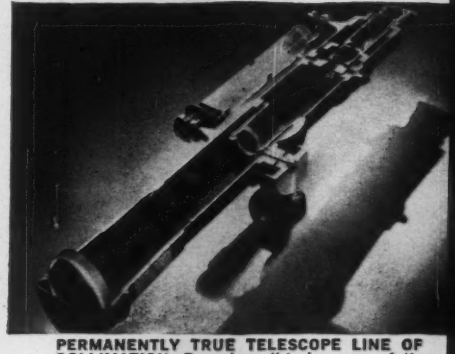

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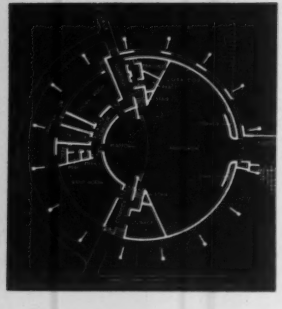

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Division Offices in Ramsey, N. J.; Schiller Park, Illinois; Dallas, Texas
DISTRICT REPRESENTATIVES IN MAJOR CITIES THROUGHOUT THE UNITED STATES

Member A.I.T.C. and Producers' Council

. . . Legal

contract provision setting the amount to be paid for attorney fees.

The court held that the parties were competent adults who would be held to their agreement in the absence of any inequitable dealings in the inception of the contract.

Said the court: "If a competent party, uninfluenced by improper considerations, binds himself by an improvident agreement, that is something for which he may blame himself alone and for relief from which he may not importune the courts."

(1) In Re Schanzer's Estate, 177 N.Y.S. 2d 124, Surrogate's Court, New York County, May 28, 1958.

Owner Held Not Liable For Breach of Contract

A contract for architectural services may give the owner the right to abandon the contract without becoming liable for breach of contract.

In an Illinois case, for example, a board of education had entered into a contract with architects to prepare plans and specifications for and to supervise the erection of a school building.

The contract provided for certain payments for preparing the plans and specifications and for the supervision work.

The plans and specifications were prepared, but later the Board of Education determined to change the character of the building and employed other architects to prepare the new plans.

The original architects were paid for preparing the plans and specifications but brought an action to recover the fee they were to obtain for the supervision of the work and obtained a judgment. This judgment was reversed on appeal.[1]

The contract contained the following provision: "If any work designed or specified by the Architect is abandoned or suspended the Architect is to be paid for the service rendered on account of it."

The appellate court stated: "We think that this clause plainly means that upon abandonment the architect is entitled to commission upon the work done by him up to the time of abandonment or suspension but that the abandonment or suspension is not a breach of the contract permitting him to recover damages for loss of opportunity to complete the contract. In this connection, see 6 Corpus Juris Secundum, Architects, Section 16, at page 314, for cases dealing on this point."

(1) Furst v. Board of Education, Highland Park H. S. Dist., 155 N.E. 2d 654, Appellate Court of Ill., Jan. 21, 1959.

430 h.p.

350 h.p.

NEW from Cummins!
Only from Cummins!

The first ▼ *diesels of their size and h.p. built*

VT 8.

lt from the pan up for construction machines!

V 8.

Cummins has done it again! Built two V diesels in the much needed 350-430 horsepower class especially for construction machines. This opens a new world of *Cummins Diesel economy* for big scrapers, off-highway trucks, shovels, front end loaders and other equipment where there has been a demand for compact yet large bore, big displacement engines.

The 350 h.p. and the 430 h.p. V8 engines are construction diesels from front to back, top to bottom. Every kind of application—every operating condition was considered in their design. The V8's represent the *most advanced* thinking in construction power on the market today! New features, major improvements combined with Cummins proven basic design makes them the most profitable source of power you can own or operate! And here's why...

CUMMINS

CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA

INTERNATIONAL SALES & SERVICE — CUMMINS DIESEL INTERNATIONAL LTD., NASSAU, BAHAMAS — CABLE: CUMNAS
OVERSEAS FACTORY — CUMMINS ENGINE COMPANY LTD. — SHOTTS, LANARKSHIRE, SCOTLAND

Litho in U.S.A. — MP-60

VT8-430

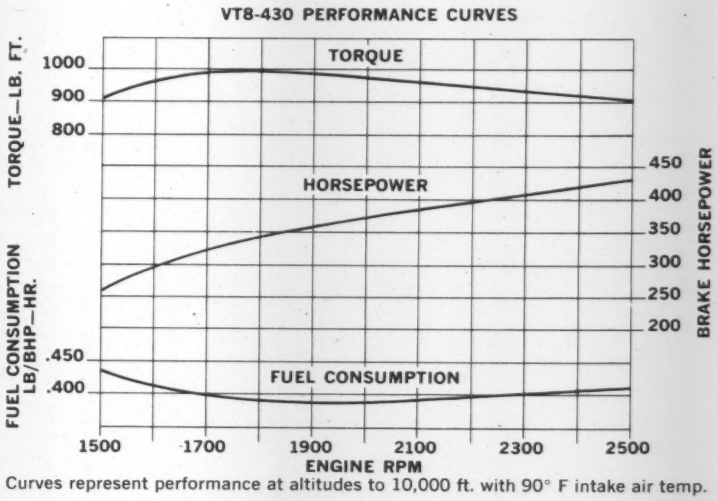
THE DIESEL THAT DELIVERS THE PERFORMANCE OF ENGINES WITH *4 MORE CYLINDERS!*

430 horsepower! 990 ft. lbs. peak torque! 950 cubic inch displacement! 7 lbs. per h.p.! Less than 59 inches long! Put these facts together and you have the rugged Cummins VT8-430 TURBODIESEL® Engine—the diesel that's as much as 40% smaller and more compact than engines in current use delivering equal power.

From its very concept, the VT8-430 was designed to give you the benefits of turbocharging. Not only does turbocharging pack more power into the engine, but it assures full rated horsepower up to 10,000 feet. Cummins engineers have developed a lightweight, perfectly-balanced turbocharger that gives fast acceleration—trouble-free performance. Further, the VT8 operates at low exhaust temperatures assuring long life for both the engine and turbocharger.

Cummins puts the accessories on top of the block, in the "V" formed by the cylinder banks. This means greater accessibility, easier maintenance, less costly repairs. Internally, new insert-type injectors are much easier to install and service. Wet-type liners require less time to remove, less care to install. These are only few of the many advantages of this new Cummins Construction Diesel.

All in all, the VT8-430 gives you a combination of high performance, low fuel costs (see chart below), long operating life as well as a lower initial investment than the larger engines in its power class. You can't beat this kind of economy!



Curves represent performance at altitudes to 10,000 ft. with 90° F intake air temp.

V8-350

NEVER BEFORE, SO MUCH POWER FROM SUCH A COMPACT, NATURALLY-ASPIRATED DIESEL!

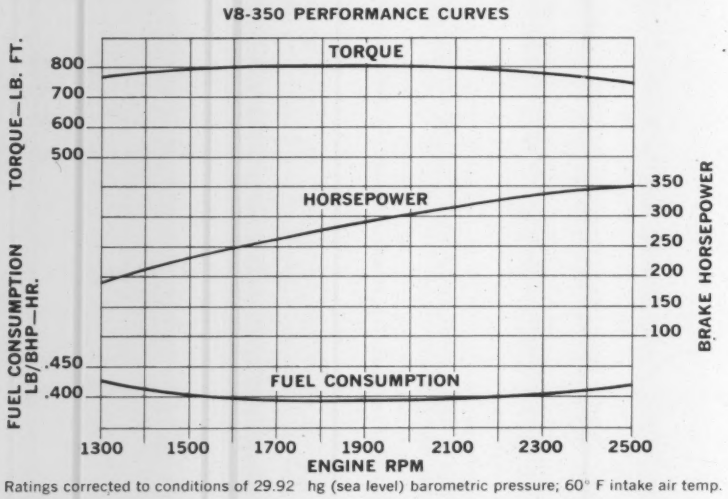
Here's rugged construction power! 805 ft. lbs. peak torque —*naturally!* (See curves below.) Like the VT8, this engine has a piston displacement of 950 cubic inches and rotates at 2500 rpm. This produces 350 horsepower in a package that's less than 57 inches long.

The V8-350 has many new features to reduce operating costs. New internal fuel and oil lines eliminate threaded connections, damage to exposed lines. Cummins own 12 cfm air compressor is supplied on both engines. Of simple, one cylinder design, here is the only unit in the trade backed by a 3600 hour or one year warranty.

Another practical advantage of the V8 Diesels is the 2500 rpm. This gives you an ideal relationship of horsepower, torque and speed to permit the use of lighter, more compact, less costly transmissions. In other words, your initial investment is reduced as well as the maintenance cost during operating life.

Cummins exclusive PT fuel system also reduces maintenance and fuel costs. It operates on lower priced No. 2 diesel fuel . . . has fewer parts than any other diesel fuel system. The pump is mounted in the 90° angle formed by the cylinder banks. Also possible, on the V8-350 . . . either the intake or exhaust manifold can be placed inside the "V" to fit your application requirements.

Get the complete profit-making story on these new compact V diesels, and on the models in which they are available, from your nearest construction equipment representative or Cummins Distributor.



Ratings corrected to conditions of 29.92 hg (sea level) barometric pressure; 60° F intake air temp.

Bidding is Tight for Hawaii Paving Job

To complete an approach road to twin tunnels through the Koolau mountain range on the Island of Oahu, Hawaii, a 2.4-mile stretch of Likelike Highway, a four-lane divided road, is being paved at a cost of $687,779. The tunnels, half-a-mile long, are the keystone of a new major commuter route linking the windward side of the island to Honolulu. George Awai, State Department of Transportation, Honolulu, is the engineer.

The award to Highway Construction Co., Ltd., Honolulu, was on a low bid less than 3% under the second and only 4.6% under the third low of the eight bids.

Work includes grading, laying base course, paving, installing highway lighting and traffic systems, and related work.

Water-cement ratio of Class A-1 concrete is a maximum of 6.25 gal per sack of cement. Minimum cement content is 6.3 sacks per cu yd.

Minimum prevailing wages range from a high of $2.65 for skilled, through $2.25 for semi-skilled, to $2.10 for common laborers.

The eight bids on this Hawaii job included:

1C Highway Constr. Co., Ltd. Honolulu	$687,779
2 J. M. Tanaka, Inc. & Constr. Equip., Inc., a joint venture, Honolulu	708,372
8 Honolulu Buildings, Ltd., Honolulu	794,094

Bids: 2-11-60 Items	Unit	Quantity	Unit Prices 1C	2
Excavation, roadway	cy	11,400	$1.80	$2.45
struct, other than bridges	cy	1,000	3.00	4.70
ditch & channel	cy	255	3.00	4.00
Sprinkling	Mgal	2,170	2.50	3.00
Borrow, select, subbase crse	cy	8,340	3.25	3.65
Base, untreated	cy	28,410	3.75	3.72
Asph, slow cure liq, prime ct	gal	29,000	0.22	0.22
conc pavement mix, No. III	t	6,840	10.00	9.75
No. V	t	4,540	10.00	9.75
Portland cmt conc pavement	cy	935	32.00	35.70
Conc, cl A-1, other than bri	cy	175	70.00	70.00
cl B-1, other than bri	cy	27	65.00	55.00
Stl, reinf, other than bridges	lb	3,100	0.25	0.20
Cor galv sht met pipe, 24", 14 gage	lf	1,030	6.00	6.10
flared end section for	ea	1	85.00	100.00
Cor galv sht met spillway, 24", 16 gage	lf	1,120	4.50	4.35
Centerline monuments	ea	14	75.00	10.00
Conc curb, cast in pl, tp A	lf	17,560	2.40	2.15
tp B	lf	970	2.70	2.00
tp C	lf	210	4.00	5.00
tp D	lf	430	2.40	1.90
gutter, cast in pl, tp A	lf	440	2.80	3.75
tp B	lf	310	3.20	1.60
tp E	lf	5,720	7.00	7.85
tp E-1	lf	3,060	6.30	7.25
tp F	lf	4,700	7.00	8.40
tp G	lf	1,080	8.50	9.85
curb & gutter, cast in pl, tp AG	lf	8,560	3.00	3.15
tp DG	lf	480	2.90	3.00
tp EG	lf	7,150	3.20	3.15
Precast conc curb, tp A	lf	420	1.50	3.00
tp D	lf	130	1.60	2.75
Conc sidewalk, plain	sf	3,200	0.55	0.52
Asph conc traffic roll	t	11	36.00	27.00
Grd rail, wood w conc posts	lf	7,310	3.25	3.65
reconstructed	lf	440	2.50	1.50
new wood post for	ea	5	20.00	10.00
new rail panel for	ea	5	50.00	7.00
Cast iron frame & cover, type A, for S.D. manhole	ea	3	45.00	50.00
type B, for catch basin	ea	19	45.00	40.00
frame & grating, type C	ea	16	100.00	90.00
salv frame & cover, instal	ea	2	30.00	25.00
Manhole frame & cover, adjust	ea	1	40.00	50.00
Survey monu fr & cov, adjust	ea	1	40.00	35.00
Brickwall for reconstr MH	lf	10	40.00	25.00
Topsoil, imported	cy	4,300	3.30	2.90
Sodding surfaces	sf	224,000	0.05	0.048
Signs, destination	ea	1	100.00	210.00
direct, reg & warn	ea	55	30.00	29.60
Reflectorized delineators	ea	17	15.00	8.15
Federal aid markers	ea	3	50.00	45.00
additional number plate	ea	1	5.00	10.00
Hwy ltg sys on met lamp post	ls	job	3,500	3,525
on brackets on wood post	ls	job	3,000	3,350
Protect & maintain exist wk	fa	job	10,000	10,000
Traffic signal system	ls	job	11,000	10,830
Utility structs, excavation	cy	210	16.00	5.75
class B-1 concrete for	cy	41	115.00	85.00
reinf steel for	lb	2,600	0.30	0.20
Prest conc pullboxes, instal	ea	24	60.00	61.00
Ducts encased in plain concrete jackets, instal 2	lf	740	2.20	2.25
instal 4	lf	6,600	3.10	3.05
instal 6	lf	6,900	4.00	4.05
Transite duct, direct burial, instal 1	lf	220	1.50	1.40
instal 2	lf	180	1.60	1.50

Commence: 3-14-60. Complete: 120 working days
Liquidated damages: $150/day

Ten Hour Work Day Set for North Dakota Road

Schultz & Lindsay Gravel Co., bidding with The Haggard Construction Co., both of Fargo, N. D., was successful bidder at $628,506 for this 23.726 miles of base asphaltic concrete surfacing, and incidental work, on U.S. Hwy. 85 in Divide and Williams Counties. The award was less than 2% below the second low bid, and only 7% under the high of the eight bids.

A ten hour work day is stipulated for the 100 working days in which the contract is scheduled for completion.

Hiring or rental of trucks with trailers or semi-trailers, for the hauling of materials, must be on an hourly, cu yd mile, or ton mile basis. The rates to be paid for such trucks, tabulated below, include the cost of all fuel, lubricants, repairs, supplies and incidental work necessary to keep the vehicles in good operating condition. They do not include the wages of the operators or workmans compensation insurance.

Truck Capacity (cu yd of haul)	$/hr	Truck Capacity (cu yd of haul)	$/hr
*Service trucks	0.75	4½	1.70
2½	0.95	5	1.95
3	1.00	5½	2.20
3½	1.25	6	2.25
4	1.50		

* Haul 2 cu yd or 2.8 tons, or less

Haul Rate Zones Point of Loading, 0 Mile Point	Minimum Rate per ton mi cents	cu yd mi cents
0-3 mile point	6.0	8.5
3-5 mile point	3.1	4.5
5 mile point & beyond	2.8	4.0

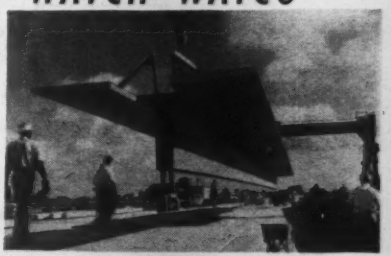
Minimum wage rates specified for the job include: carpenter, $2.00; asphalt, bituminous stabilizer plant op-

(Continued on page 136)

In the field of
HYDRAULIC DREDGING
GAHAGAN
a leading name for over 50 years

Gahagan Dredging Corporation,
90 Broad St., New York 4, N. Y.
Write, wire or phone Whitehall
3-2558. Cable "Walgahagan".

WATCH WATCO



104' Single Tee — Maule Ind., Miami
STEEL FORMS

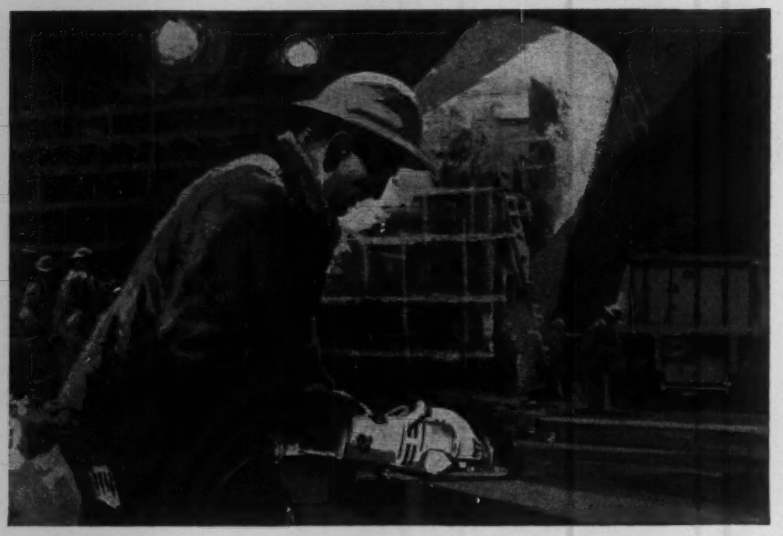
Nationwide acceptance of Watco steel forms for the precast, prestress industry is gratifying.

We would like to fill your particular form requirements whether standard or custom units.

Write for illustrated folder on newest Single Tee forms

watco

Division of Plant City Steel Corporation
P. O. Box 1308, Plant City, Florida

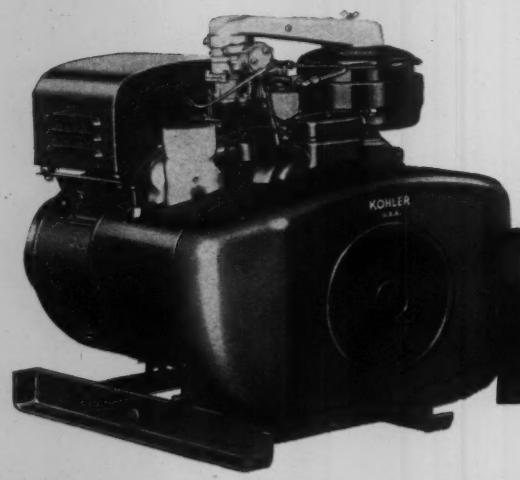


Reliable, cost-saving independent power···

Kohler Electric Plants

Kohler electric plants have proved their rugged efficiency on new turnpike construction, building projects—wherever reliable power is needed for floodlights, power tools. Engineered for fast, all-weather starting, round-the-clock stamina on tough schedules where time means money . . . Sizes to 100 KW, gasoline and diesel, include compact, 4-cycle, air-cooled models . . . and emergency models for toll plazas, maintenance buildings when storms or accidents cut off normal power source . . . Write for folder G-23.

KOHLER CO. *Established 1873* KOHLER, WIS.



MODEL 5RM61, *5000 watts, 115/230 volt A.C. Remote start.*

KOHLER ELECTRIC PLANTS

KOHLER OF KOHLER

ENAMELED IRON AND VITREOUS CHINA PLUMBING FIXTURES • ALL-BRASS FITTINGS
ELECTRIC PLANTS • AIR-COOLED ENGINES • PRECISION CONTROLS

. . . North Dakota Road

erator, $2.40; laborers—asphalt rakers and spreaders, $1.50; unskilled $1.35. Since these rates may be below those paid on other construction projects in the vicinity, the contractor may be unable to get labor at the minimum specified rates.

The bidding on this road work included:

1C	Schultz & Lindsay Gravel Co. & The Haggart Constr. Co., Fargo, N. D.	$628,506
2	W. H. Noel Co., Jamestown, N. D.	639,096
8	Highway Constr. Co., Rapid City, S. D.	677,151

Bids: 2-26-60 Items	Unit	Quantity	Unit Prices 1C	2
Water for compaction	Mgal	3,374	$2.50	$3.00
Grav, pit run, subbase cl 5	t	76,643	0.98	1.15
for bit treat base	t	81,489	1.19	1.30
Bit, liq, for bit treatment	gal	888,227	0.17	0.15
for pene prime & tack	gal	115,555	0.18	0.16
Blotter sand, cl 24	t	2,954	2.00	2.10
Comb aggr for wear course, cl 20	t	35,379	3.85	4.00
Asph conc, mix wear course	gal	601,442	0.12	0.13
Bitumen for seal	gal	158,186	0.18	0.18
Cov aggr for seal, cl 23	t	4,773	7.00	6.00
Coating aid	gal	1,579	0.01	0.10

Completion schedule: 100 work days.

Liq. dam. $160/day.

North Carolina Prices

1959 Average Unit Prices on Major Contract Highway Items

Items	Unit	Average Unit Prices
Structural Items		
Excavation, uncl struct	cy	$ 2.33
dry		4.07
wet		14.07
uncl channel		2.20
Concrete, class A, bridge	cy	55.30
culvert		41.45
Steel, reinforcing	lb	0.1109
structural	lb	0.131
Piles, steel H, 12"	lf	5.575
14"	lf	8.00
prestressed concrete, 12"	lf	5.12
20"	lf	8.55
Prstr prest conc girder, 45"	lf	17.10
Roadway Items		
Clear	ac	223.69
Grub	ac	129.24
Excavation, uncl	cy	0.296
borrow	cy	0.48
Base course, soil type	cy	1.05
coarse aggregate	t	2.28
Bituminous surface treatment	sy	0.349
Sand asphalt base	t	5.29
surface	t	6.26
Bituminous concrete binder	t	5.63
surface	t	6.51
Concrete pavement	sy	3.80
RC pipe, standard 15"	lf	3.16
18"	lf	3.84
24"	lf	5.75
30"	lf	8.04
36"	lf	10.71
42"	lf	14.47
48"	lf	17.50
54"	lf	21.27
60"	lf	27.73
66"		30.60
72"		31.89
78"		51.00
extra standard 36"	lf	11.45
42"	lf	15.44
CMP, standard 15"	lf	3.60
18"	lf	4.58
24"	lf	6.12
30"	lf	7.76
36"	lf	11.53
42"	lf	15.00
60"	lf	29.26
heavy gage, 24"	lf	7.49
30"	lf	11.57
36"	lf	15.50
42"	lf	18.65
60"	lf	30.00

\$1,000? \$1,500? \$2,000? These are normal costs for training new operators —except for TORQMATIC DRIVE owners. They report saving up to \$2,000 every time they break in a "rookie."

Reason? TORQMATIC takes guesswork out of shifting – ends shock-load damage and the need for engine-disconnect clutch repairs. TORQMATIC *automatically* adjusts engine output and speed to load or terrain changes.

TORQMATIC owners know that no operator can handle the "stick" and clutch as smoothly and efficiently—*every* time – as an Allison TORQMATIC. They bought TORQMATIC because they know, too, what it costs when rookies make a shifting and clutching mistake.

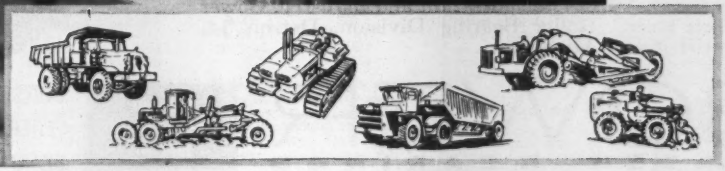
How can you eliminate these costs?

Look beyond first cost and see the total cost. Then change from clutch-pedal equipment to Allison TORQMATIC. You'll save costly engine-disconnect clutch replacements, too-frequent overhauls of overtaxed engines, repair bills for shock-load-damaged axles and drive lines.

Why not get the full story today? See your equipment dealer or write Allison.

ALLISON DIVISION OF GENERAL MOTORS
Indianapolis 6, Indiana
In Canada: General Motors Diesel Ltd.,
London, Ontario

Allison TORQMATIC



TORQMATIC® DRIVES
THE MODERN DRIVE FOR MODERN EQUIPMENT

PAYLOAD . . . tons at a gulp on Bower Roller Bearings

They call it strip mining . . . where payload is king and "don't spare the rig". Take this scraper: aided by a rugged 'dozer, it's pushloaded in mere minutes. Then, with tons of rock and earth on its back, it takes off cross-country . . . dumps the load . . . hustles back for more.

Bruising bouts like this often go on 24 hours a day, put an incredible strain on equipment *and on bearings*. Yet today's bearings—*particularly those by Bower*—more than meet the task. Their basic design advantages, coupled with fine materials and precision manufacturing, have earned them a reputation for long service under the most severe conditions. And with rarely a shutdown for maintenance.

If you produce a product that uses bearings, specify Bower. You will find this extra measure of service in the full Bower line of tapered, cylindrical and journal roller bearings for every field of transportation and industry. Bower Roller Bearing Division, Detroit 14, Michigan.

BOWER
ROLLER BEARINGS

tapered
cylindrical
journal

DIVISION OF
FEDERAL-MOGUL-BOWER
BEARINGS, INC.

Materials Prices

Monthly Market Quotations by ENR Field Reporters

LUMBER, TIMBER, PLYWOOD PER M FT.B.M., CARLOAD LOTS F.O.B.

SOUTHERN PINE AND DOUGLAS FIR

All Southern Pine is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face)

All Fir boards, dimensions, planks No. 2, Fir small timbers and timbers are No. 1. Lengths up to 20 ft. (Prices in italics)

	1x6 s4s	1x8 s4s	2x4 s4s	2x6 s4s	2x8 s4s	2x10 s4s	3x12 Rgh	6x12 Rgh	12x12 Rgh	LONG LEAF Y. P. Merchantable grade up to 20 ft. 2x12 Rgh	12x12 Rgh	FIR PLYWOOD ⅝" Interior plyscored, C-D gr.	¾" Ply-form grade*
Atlanta.....n†	$ 92.00	$ 95.00	$ 85.00	$ 95.00	$ 95.00	$100.00	$130.00	.....	.....	$140.00	$160.00	$135.00*R*	$270.00*R*
Baltimore.....e	98.00	98.00	102.50	102.50	108.00	108.00	125.00	.....	.....	175.00	190.00	175.00	275.00
	120.00g	*124.00g*	*125.00g*	*128.50g*	*138.50g*	*138.50g*	*150.00g*	*$180.00*	*$170.00*				
Birmingham....n†r	85.00	87.00	84.00	86.00	91.00	97.00	116.00	.....	.....	120.00	173.00	122.30	205.50
	80.00	*80.00*	*83.00*	*81.00*	*81.00*	*98.00*	*88.00*	*85.00*	*98.00*	.....	.....		
Boston.....ns	107.00*f*	108.00*f*	112.00*f*	112.00*f*	112.00*f*	125.00*a*	.....	.....	.....	.....	.....	155.00*c*	285.00*c*
	112.00	*112.00*	*128.00*	*128.00*	*128.00*	*138.00*	*154.00*	*156.00*	*172.00*				
Chicago.....**	120.00	123.00	117.00	131.00	139.00	140.00	135.00	.....	.....	163.00	163.00	152.00	254.00
	126.00	*126.00*	*139.00*	*137.00*	*137.00*	*138.00*	*146.00*	*146.00*	*146.00*				
Cincinnati.....n*	102.50	103.75	96.50	98.00	104.75	112.75	121.00	.....	.....	138.00	125.00	94.00*f*	175.00*f*
	108.00	*111.00*	*108.00*	*112.00*	*113.75*	*119.00*	*145.25*	*145.25*	*145.25*	.....	.....		
Cleveland.....o**	100.00	102.00	102.00	100.00	104.00	110.00	.....	.....	.....	.....	.....	124.00*a*	210.00
	.....	.....	*115.00*	*110.00*	*112.00*	*116.00*	*140.00*	*140.00*	*140.00*				
Dallas.....‡	95.00*k*	99.00*k*	103.00*k*	103.00*k*	103.00*k*	106.00*k*	135.00	.....	.....	138.00	160.00	112.50*ac*	200.00*ac*
Denver.....n*	*Not in stock*		*119.50*	*120.50*	*119.50*	*122.00*	*140.00*	*162.50*	*170.00*	.....	.....	148.50	240.50
Detroit.....‡	138.00	140.50	140.00	136.00	143.50	143.50	.....	.....	.....	151.50	.....	160.00*gc*	230.00*gc*
	139.25	*139.25*	*150.25*	*148.50*	*157.00*	*162.00*	*201.00*	*218.00*	*218.00*	.....	.....		
Kansas City....tn	120.00	120.00	130.00	132.50	135.00	150.00	.....	.....	.....	.....	.....	150.00	215.00
	120.00	*120.00*	*130.00*	*132.50*	*135.00*	*140.00*	*165.00*	*225.00*	*225.00*	.....	.....		
Los Angeles....znu	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*136.00*	*145.00*	*145.00*	.....	.....	128.00	225.00
Minneapolis....ov	*145.00*	*145.00*	*145.00*	*145.00*	*145.00*	*145.00*	*185.00*	*185.00*	*185.00*	.....	.....	195.00	305.00
Montreal.....*bp	84.00*a*	90.00*a*	84.00*a*	84.00*a*	99.00*a*	125.00*a*	.....	.....	.....	120.00	120.00	119.25	225.95
	160.00	*160.00*	*160.00*	*160.00*	*160.00*	*160.00*	*170.00*	*170.00*	*170.00*				
New Orleans...†n	89.00	89.00	96.00	95.00	95.00	98.00	126.00	.....	.....	160.00	155.00	119.19	205.71
	115.50	*115.50*	*115.50*	*115.50*	*115.50*	*116.50*	*122.00*	*135.50*	*135.50*	.....	.....		
New York.....	113.00	115.00	124.00	125.00	125.00	127.00	250.00	.....	.....	245.00	245.00	123.20*a*	211.60*a*
	.....	.....	*126.00*	*125.00*	*125.00*	*127.00*	*169.00*	*174.00*	*174.00*	.....	.....		
Philadelphia....nt	110.00	112.00	112.00	110.00	112.00	110.00	135.00	.....	.....	.....	.....	150.00*h*	280.00*h*
	.....	.....	*125.00*	*125.00*	*125.00*	*125.00*	*200.00*	*200.00*	.....				
Pittsburgh.....sl	135.00	135.00	135.00	135.00	140.00	140.00	165.00	.....	.....	145.00	185.00	225.00	295.00
	135.00	*115.00*	*145.00m*	*150.00*	*150.00*	*150.00*	*225.00*	*225.00*	*225.00*	.....	.....		
St. Louis.....‡ln	119.00	121.00	129.00*d*	129.00*d*	129.00*e*	128.00*e*	.....	.....	.....	.....	.....	167.30*achj*	*255.00ach*
	.....	.....	*138.00*	*138.00e*	*138.00e*	*138.00e*	*194.00e*	*194.00e*	*194.00*	.....	.....		
San Francisco..nz	*86.00*	*86.00*	*89.00*	*89.00*	*89.00*	*89.00*	*102.00*	*124.00*	*126.00*	.....	.....	94.00*h*	172.00*h*
Seattle.....n†	*65.00*	*70.00*	*73.00*	*73.00*	*73.00*	*74.00*	*85.00*	*90.00*	*95.00*	.....	.....	105.00*aeg*	205.00*aeg*
Toronto.....*	87.00*a*	90.00*a*	88.00*a*	87.00*a*	90.00	89.00*a*	105.00*a*	.....	.....	91.00*a*	.....	256.00	305.50
	92.00	*94.00*	*105.00*	*106.00*	*108.00*	*112.00*	*135.00*	*150.00*	*150.00*	.....	.....		

† F.o.b. mill. * F.o.b. city, CL, out of yard. ** F.o.b. city, CL, direct mill shipment. ‡ Deliv. to contr. CL. R revised

LUMBER: Bold Face Type, Southern Pine. Italics, Douglas Fir. *a Spruce. *b Federal tax exempt, add 8% mun. & prov. tax. *c 5M lots. *d 8, 10, & 12 ft. lengths. *e 8 to 16 ft. lengths. *f Hemlock *g No. 1 common. *j 8 ft. lengths. *k No. 3 common. *l Add 2% sales tax. *n Less 2% disc. 10 days. *o Less 2% disc. 10th. *p Less 1% disc. 10 days. *q fir: $80.25 in truck lots, fob job or CL, f.o.b. city. *r For f.o.b. city price add $8 for pine, $38 for fir eff. 1/1/58. *s asd trucklots. *t trucklots del. *u Retail LCL yard. *v Retail LCL, del. *w add 8% mun. & Prov. tax. *x add 4% sales tax.

* PLYWOOD (Plyform, oiled and edge sealed): Douglas fir, 4' x 8' panels, 5-ply sanded 2 sides, carload lots, delivered per 1000 sq. ft. surface. Seattle base price, interior, moisture resistant, ⅜", $151.00; ¾", $171.00 Exterior, waterproof, ⅜", $155.00; ¾", $175.00. *a Delivered. *c Truck lots. *d A-C exterior. *e LCL. *f less 1%, 5 days. *g less 2% for cash. *h less 2% disc, 10 days. *j add 2% sales tax.

GLASS, EXPLOSIVES, CHEMICALS, PILES, TIES

	WINDOW GLASS Discounts from jobbers list, Feb. 1, 1950*a* Single or Double Strength A quality	B quality	EXPLOSIVES Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 500 lb. lots	
Atlanta	78%	80%*g*	$0.2495	
Baltimore	74%*d*	74%*d*	.2695	
Birmingham	82%*f*	82%*f*	.2495	
Boston	72+10%*p*	72+10%*p*	.2695	
Chicago	72%	72%	.2695	
Cincinnati	74%	74%	.2495	
Cleveland	74-2-10%	74-2-10%	.2495	
Dallas	76%	76%	.2770	
Denver	73.5%	73.5%	.2695	
Detroit	74-10-10%	74-10-10%	.2695	
Kansas City	76-10-10%	76-10-10%	.2695	
Los Angeles	$12.88/17.32*h*	$10.45/14.13*h*	.2695	
Minneapolis	71-10%	71-10%	.2695	
Montreal	40-10-5%*b*	40-10-5%*b*	23.20*h*	
New Orleans	76%*q*	76%*q*	.2695	
New York	79%*l*	79%*l*	.5030*g*	
Philadelphia	78%	80%	.2695	
Pittsburgh	72%	72%	.2495	
St. Louis	72-10-10%*mo*	72-10-10%*mo*	.2695	
San Francisco	60%	73%	.2695	
Seattle	$8.85/11.55*hiq*	$6.41/8.67*hjp*	.2695	
Toronto	$6.49/9.57*h*	$5.90/8.70*h*	.2695	

Price of 60% Ammonia Gelatin is $0.15 per lb. higher than 40% in U. S., $1.75 per 100 lbs. higher in Canada.

Glass: *a Jobbers' list price per box, 14 x 20, ss, $42.75 for A quality, $37.50 for B quality; 14 x 20, ds, $60.00 for A quality, $52.75 for B quality. *b sales tax extra. *c 77% for single strength. *d From 6/15/52 list. *e 77% for double strength. *f Single strength; double strength, 83%. *g From 8/1/58 list. *h ss/ds, 40-in. *i 20 boxes min. *j CL quantity. *k eff. 12/58. *l eff. 10/15/58. *m less 2% disc, 10 days. *n less 1% disc, 10 days. *o add 2% sales tax. *p less 1% for cash. *q less 2% for cash

Explosives: Cartridges of 1¼" diameter or over, in standard lengths. *g deliveries in certain areas must be by truck or by truck and boat, requiring extra charge. *h F.o.b. Beloeil (near Montreal), per 100 lb., lots under 2000*s*, wood cases, forcite, 40%. Forcite 60%, $24.30 In fiber cases: forcite 40%, $24.05; forcite 60%, $25.80.

40% Ammonia Gelatin price ranges in other than urban areas, per lb: (except Seismograph Grades)

	C/L 300,000 lb. lots	10,000 lb. lots	2,000 lb. lots	200 lb. lots
Group 1*	$0.2095	$0.2195	$0.2545	$0.2695
Group 2†	.2170	.2270	.2620	.2770

* All areas except those in Group 2 and N.J. cities of Bayone, Hoboken, Jersey City, No. Bergen, Union City and Weehawken † Florida counties of Manatee, Hardee, Highlands, Okeechobee, St. Lucieand south thereof; Idaho; Maine; Montana; New Mexico counties of Curry, Socorro, Lincoln, De Baca, Roosevelt and south thereof; Texas counties of Bailey, Lamb, Hale, Floyd, Motley, Cottle, Hardeman, Foard, Knox, Haskell, Jones, Taylor, Coleman, McCulloch, San Saba, Burnet, Williamson, Milan, Robertson, Leon, Houston, Angelina, Nacogdoches, Shelby and south thereof.

PILES

Prices per linear foot, fir and pine, rough peeled, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine under fifty feet based on freight from mid-South, over fifty feet, on freight from deep South.

Dimensions	Points	Length	By Rail Pine*§ R	By Rail Fir R
12" at butt	6-in.	30 to 39-ft.	$0.42*a*	....
12"—2-ft. from butt	6-in.	40 to 44-ft.	.91	....
12"—2-ft. from butt	6-in.	45 to 49-ft.	.97	....
12"—2-ft. from butt	6-in.	50 to 54-ft.	1.01	....
12"—2-ft. from butt	6-in.	55 to 59-ft.	1.07	....
14"—2-ft. from butt	6-in.	60 to 64-ft.	1.14	....
14"—2-ft. from butt	6-in.	65 to 69-ft.	1.21	....
14"—2-ft. from butt	6-in.	70 to 74-ft.	1.34	1.40
14"—2-ft. from butt	6-in.	75 to 79-ft.	1.41	1.40
14"—2-ft. from butt	5-in.	80 to 84-ft.	1.54	1.45
14"—2-ft. from butt	5-in.	85 to 89-ft.	1.67	1.54

* Pine piling over 90 feet available only in limited quantities. § ASTM Class B

* a, trucked in from N. J.

RAILWAY TIES

Prices f.o.b. per tie box carload lots:

		8' x 8" x 8' Untr.	8' x 8" x 8' Tr.	7' x 8" x 8'6" Untr.	7' x 8" x 8'6" Tr.
Birmingham*..	Hardwood, Grade 3	$1.70	$2.55	Gr. 5 $2.25	$3.33
	Grade 2	1.50	2.35	" 4 2.10	3.18
	Grade 1	1.15	2.00	" 3a 1.70	2.78
Chicago	Red Oak	2.85–3.00	4.00*a*–4.10	3.90	4.75–5.00
New York	Mixed Hardwood	3.45	5.10	4.30	6.50
	Mixed Oak	3.55	5.20	4.40	6.60
Philadelphia	Mixed Oak	3.70*i*	3.87	....	4.57
St. Louis	Mixed Oak	2.65	3.75*a*	3.10*h*	4.20*ah*
San Francisco	Douglas Fir	2.10*ef*	3.42*ef*	2.44*ef*	3.72*ca*

Tr.—Treated; Untr.—Untreated. *a* Creosoted. *c* Empty cell. *e* Green f.o.b. cars. *g* 7 x 9 x 8'6" * Add 75¢/tie freight charge to Birmingham. *h 7" x 9" x 9½" *i Mixed Hardwood

CHEMICALS

Water, sewage treatment, road work, carlots, f.o.b. works

Bleaching powder in drums per 100 lb.	$5.02
Chlorine cylinders, liquid, per lb. freight allowed, N.Y. State	.11
Calcium chloride, 77–80%, flaked, 100-lb. paper bag, ton	32.00
Silicate of soda, 52 deg., in drums, per 100 lb.	2.65
Soda ash, 58%, in paper bags, per 100 lb. dense	1.90
Sulphate of aluminum, commercial, in 100-lb. bags	2.05
Sulphate of copper, in bags, 99% per 100 lb., reg., 25.2% copper content	13.00

See following ENR issues for OTHER PRICES:

- Wage Rates, Building Board, Lath, Insulation: Last, Apr. 28; Next, June 2.
- Cement Aggregate, Ready-mixed Concrete, Asphalt: Last, May 5; Next, June 9.
- Iron & Steel Products, Pipe: Last, May 12; Next, June 16.
- Clay Products, Lime, Plaster, Paint, Roofing: Last, Apr. 28; Next, May 26.

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, MARIE MORAVSIK, ELAINE CHOMYAK, ELIZABETH WERRA, ELEANOR QUERET, Reports, J. H. WEBBER, E. R. HUBER, Statistics.

NEW ENGLAND

BUILDINGS—BA

Mass., Tewksbury — NOVITIATE HOUSE — BA 5/26 — Society of Oblate Fathers for Mission Among the Poor, (selected list bidders) novitiate house, Chandler St. $400,000. Chester F. Wright, 681 Main St., Waltham, archt.

▲ **Mass., West Roxbury**—HOME FOR AGED—BA 5/31—Hebrew Home for the Aged, Centre St., home for aged. $3,000,000-$4,000,000. Extended date. Krokyn & Krokyn, 184 Boylston St., Boston, Mass., archts. CD 4/26.

Mass., North Attleboro—SCHOOL—BA 6/2—Town, 45 S. Washington St., Junior High School, off Amvet Ave. $900,000. Haldeman & Jacoby, 47 W. Elm St., Brockton, archts. CD 4/15, under LB.

Mass., Norwood—HOSPITAL ADDN., etc.—BA 6/2—Norwood Hospital, 729 Washington St., hospital addns., alterations, Washington St. $400,000. Plans deposit $100. James H. Ritchie & Assoc., 135 Clarendon St., Boston, archts.

▲ **Vt., Waterbury**—HOSPITAL—BA 6/7—State Bldg. Council, State House, Montpelier, hospital addn. at State Hospital. $1,500,000. Webber & Erickson, 56½ Merchants' Row, Rutland, archts. Jennison Engineering, Inc., 95 College St., Burlington, mech. engr. CD 7/16.

▲ **Mass., Cambridge**—SCHOOL—BA 6/10—City School Dpt., 1700 Cambridge St., elementary school, Linnaean St. $1,700,000. Hugh A. Stubbins Assoc., 806 Massachusetts Ave., archts. CD 8/5.

▲ **R. I., Providence**—SCHOOL—BA 6/17—City, School Bldg. Comn., City Hall, Mary E. Fogarty Elementary School, Oxford, Sales and Miner Sts., South Providence. $1,000,000. Kent, Cruise & Aldrich, 423 Industrial Bank Bldg., archts. CD 7/16.

BUILDINGS—SLC

▲ **Conn., New Haven**—OFFICE—First New Haven National Bank, 42 Church St., soon lets general contract 8 story, 112,000 sq. ft., 70x200 ft. front and rear glass with granite trim office, $2,700,000. Douglas Orr, 111 Whitney Ave., archt. Paul Rudolph, 31 High St., engr. CD 11/12/58.

Conn., Waterbury—HOSPITAL—Waterbury Hospital, 64 Robbins St., soon lets contract Waterbury Hospital addn., alterations, $800,000. Kiff, Colean, Voss & Souder, 230 Park Ave., New York, N. Y., archts. Weiskopf & Pickworth, 2 W. 45th St., New York, N. Y., engrs. Phillips & Elbal, 350 Fifth Ave., New York, N. Y., mechanical engrs. CD 4/21.

R. I., South Kingstown—NOVITIATE UNITS, etc.—Sisters of the Cross & Passion, soon lets contract, Novitiate Units A, B & C and Cloisters. Approx. $450,000. Charles A. Maguire & Assoc., Turk's Head Bldg., Providence, engrs.

HEAVY CONSTRUCTION—LB & CA

▲ **VERMONT**—State Hy. Dpt., State House, Montpelier, **Landers & Griffin, Inc.,** 800 Islington St., Portsmouth, N. H., and **Morrison-Knudson Co., Inc.,** 150 E. 42 St., New York, N. Y., (Joint Venture), CA **$1,387,495,** road and bridges, Contr. No. 3, I-89-2(7), Waterbury-Bolton. Bids Apr. 29. CD 5/3, under LB.

VERMONT—State Dpt. Hys. State Office Bldg., Montpelier, Bids opened 5/6,

Miller Constr. Co., and Caledonia Sand & Gravel Co., Inc., P. O. Box 138, St. Johnsbury, Vt., (Joint Venture), LB **$896,250,** est. $900,000, Highway and 3 bridges, Rte. 4, F-020-2(3), Bridgewater. CD 4/11.

† **Great Lakes Dredge & Dock Co.,** 17 Battery Pl., New York, N. Y., CA **$569,165,** est. $462,300, imprvt. dredging Boston Harbor-Reserve Channel, Boston. CIVENG-19-016-60-38, MASSACHUSETTS. U. S. Eng., 424 Trapelo Rd., Waltham, Mass. Bids Mar. 29, awarded May 2. CD 4/4, under LB.

BUILDINGS—LB & CA

▲ **Sawyer Constr. Co.,** Blanchard Rd., Burlington, Mass. CA **$1,013,000,** est. $1,000,000, multiple unit HOUSING, Demerritt Rd., DURHAM, N. H. University of New Hampshire, Thompson Hall, Durham, N. H. Bids Apr. 13. CD 4/15, under LB.

▲ **Alex M. Pappas,** 28 Leicester St., Auburn, Mass., Separate Contracts, Approx. **$1,000,000,** MOTEL, Southbridge St. near Mass. Turnpike, AUBURN, MASS. CD 3/24/59.

▲ **Municipal Auditorium Comn.,** 44 School St., Boston, Mass., rejected bids Mar. 23, AUDITORIUM, Prudential Center Site, Boylston and Dalton Sts., BOSTON, MASS. LB **$9,993,000.** CD 3/25, under LB.

Berry & Molloy Builders, Inc., 45 Randolph St., Canton, Mass., CA **$407,000,** RESIDENTIAL DEVELOPMENT, New Kimberly II, Rte. 138, CANTON, MASS. Owner, c/o contractor.

Bowen Constr. Co., Indian Trails, Rte. 126, Framingham, Mass., CA **$401,000,** RESIDENTIAL DEVELOPMENT, Indian Trails, Rte. 126, FRAMINGHAM, MASS. Owner, c/o contractor.

Martin Cerel, 18 E. Central St., Natick, Mass. Owner Builds, **$418,000;** RESIDENTIAL DEVELOPMENT, Harborwood III, Pond St., FRANKLIN, MASS.

Martin Cerel, 18 E. Central St., Natick, Mass., Owner Builds, **$409,000.** RESIDENTIAL DEVELOPMENT, Presidential Heights, Lowell St., PEABODY, MASS.

Western Mass Contracting & Engineers, Inc., Monument Valley Rd., Great Barrington, Mass., CA Approx. **$400,000,** steel fabricating PLANT, Central Berkshire Blvd., PITTSFIELD, MASS. A. Leo Nash Steel Corp., 50 E. Mill St., Pittsfield, Mass. CD 11/25.

Doric Builders, Inc., 76 Peterboro St., Boston, Mass., Owner Builds, **$400,000,** RESIDENTIAL DEVELOPMENT (second section), Ridgewood Estates, Forest Rd., STOUGHTON, MASS.

▲ **Samuel Berkowitz Corp.,** 955 Main St., Bridgeport, Conn., CA **$1,000,000,** 7 story, 44 unit, stone, brick APARTMENTS, 2604 Park Ave., BRIDGEPORT CONN. Park Ave. Cooperative Apartments, Inc., c/o Victor Civkin, archt., 12 Ermine St., Fairfield, Conn. CD 2/16.

Seymour H. Sard, 21 Proctor Dr., West Hartford, Conn. Owner Builds, **$570,000,** 57 HOUSES, Finnemann Rd., FARMINGTON, CONN. CD 3/7.

▲ **Giordano Constr. Co.,** 287 Main St., Branford, Conn., CA **$1,624,000,** general contract Horace Wilcox Regional Technical SCHOOL, MERIDEN, CONN., State P. Wks. Dpt., 165 Capitol Ave., Hartford, Conn., Bids Apr. 13. CD 4/15, under LB.

Arthur Olesen, 28 Mountain View Dr., Newington, Conn., Owner Builds, **$590,000,** 50 HOUSES, Mountain View Heights, NEWINGTON, CONN.

Woodbine Realty Trust, 147 Central St., Lowell, Mass., Separate Contracts, **$480,000,** 30 home RESIDENTIAL DEVELOPMENT, First Section, WESTFORD, CONN.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲ **NEW YORK**—BA 6/15—Triborough Bridge & Tunnel Auth., Administration Bldg., Randall's Island, New York, Zone 36, Narrows Bridge Contr. NB-4, furnishing, del. metalwork for cable anchorages incl. cable anchor bars, structural framing and cable saddle castings. Plans deposit $20. CD 1/20/55.

BUILDINGS—BA

▲ **Pa., Bangor**—SCHOOL—BA 5/25—Bangor Area Joint School Auth., high school, $1,800,000. Plans deposit $100. S. W. Herring Everett Assoc., 512 Hamilton St., Allentown, archts.-engrs. CD 4/30.

▲ **N. J., Plainfield**—HOSPITAL ADDN.—BA 5/26—Muhlenberg Hospital, Park Ave., 3 story hospital addn. $1,500,000. Ferrenz & Taylor, 152 W. 42 St., New York 36, N. Y., archts. CD 2/13/57.

▲† **D. C., Wash.**—CARTOGRAPHIC ENGINEERING—BA About 6/14—U. S. Eng., 1st and Douglas Sts. N.W., 5 story, 112 x 130 ft. Cartographic Engineering Bldg. at Army Map Service, ENG-49-080-60-34(47). Over $1,000,000. Lawrie & Green, 321 N. Front St., Harrisburg, Pa., archts. CD 6/17.

▲† **D. C., Wash.** — DOMICILIARY — BA On Or About 6/21—U. S. Eng., 1st and Douglas Sts. N.W., Zone 25, 7 story, approx. 209,750 sq. ft. rein.-con., masonry walled Domiciliary, pile fdns. Soldiers Home, ENG-49-080-60-61(67). Plans deposit $7.50. CD 12/11.

N. Y., East Hampton—SCHOOLS—BA 6/28—Bd. Educ., Union Free School Dist. No. 1, high school addn., $400,000; elementary school, $400,000. A. F. Gilbert & Son, 358 5th Ave., New York, Zone 1, archts. CD 8/13/59.

N. Y., New Castle — HEADQUARTERS — Bids Asked — Petroleum Heat & Power Co., Inc., 240 Mineola Blvd., Mineola, headquarters, Grant Ave. between Garden and Hopper Sts. $500,000. Watson & Leslie, 174 Mineola Blvd., Mineola, archts.

BUILDINGS—SLC

▲ **N. Y., Brooklyn**—OFFICE—Brooklyn Union Gas Co., 176 Remsen St., Zone 12, soon lets contract 14 story office, 195 Montague St. Francisco & Jacobus, 511 5th Ave., New York, Zone 36, archts. CD 1/28.

N. Y., New Rochelle—CARDINAL SPELLMAN HALL—Archdiocesan Bldg. Comn., 451 Madison Ave., New York, Zone 22, soon lets contract Cardinal Spellman Hall at Iona College. Eggers & Higgins, 100 E. 42nd St., New York, Zone 17, archts. CD 3/31, under LB.

N. Y., New York—SCHOOL, etc.—Archdiocesan Bldg. Comn., 451 Madison Ave., Zone 22, soon lets contract St. Francis of Rome school and convent addn., Bronx Boro. Over $400,000. Edward Fleagle, 18 S. Broadway, Yonkers, archt.

HEAVY CONSTRUCTION—LB & CA

▲ **Fago Brothers,** 521 Young St., Buffalo, N. Y., CA **$1,785,005,** water transmission main, BUFFALO, N. Y. Erie County Water Auth., 338 Ellicott Sq., Buffalo, N. Y. Bids Apr. 14, awarded May 4. CD 4/19, under LB.

Schwab Bros. Trucking Co., 370 Sawyer Ave., Tonawanda, N. Y., CA **$574,711,** est. $750,000 (3 bidders) sewers in Virginia St. and Virginia St. Extension, BUFFALO, N. Y. Buffalo Sewer Auth., City Hall, Buffalo, N. Y. Bids Apr. 18. CD 4/13.

BUILDINGS—LB & CA

Metzger Constr. Co., 2570 New Walden Ave., Cheektowaga, N. Y., CA **$503,000,** 105 bed HOME ADDN., BUFFALO, N. Y. Niagara Lutheran Home, 64 Hager St., Buffalo, N. Y. CD 2/26.

▲ **Siegfried Constr.,** 6 N. Pearl St., Buffalo, N. Y., CA **$1,063,269,** Huron PARKING RAMP, BUFFALO, N. Y. City P. Wks. Comn., 502 City Hall, Buffalo, N. Y. Bids Apr. 14, awarded May 4. CD 4/19, under LB.

▲ **Gens Jarboe, Inc.,** 101 Park Ave., New York 17, N. Y., CA Est. **$1,000,000,** St. Vincent De Paul SCHOOL and CONVENT, ELMONT, N. Y. Diocese Rockville Centre Bldg. Comn., 253 Sunrise Hy., Rockville Centre, N. Y. Bids Apr. 20. CD 3/29.

Bd. Educ. Union Free School Dist. No. 8, Town of Greenburgh, R. J. Bailey School, 33 West Hillside Ave., White Plains, N. Y., rejected bids Apr. 14, general constr., plumbing, heating and ventilating and electrical Woodlands Secondary Education Center, GREENBURGH, N. Y. Perkins & Will, 55 Church St., White Plains, N. Y., archts. New bids in July. CD 4/6.

▲ **John Oechslin Inc.,** Commack Rd., Commack, N. Y., CA Est. **$1,000,000,** CHURCH and CONVENT for St. Anthony of Padua Parish, EAST NORTHPORT, N. Y. Diocesan Bldg. Office, 253 Sunrise Hy., Rockville Centre, N. Y. Ballard, Todd & Snibbe, 123 E. 77th St., New York 21, N. Y., archts. CD 5/2.

▲ **East River Terrace Cooperative, Inc.,** c/o Leo Stillman, archt., 332 E. 149 St., New York, Zone 51, N. Y., and Stanley Rapaport, archt., 32 Union Sq., New York 3, N. Y., Separate Contracts, **$3,000,000,** 16 story cooperative APARTMENT, 316 E. 96 St., NEW YORK, N. Y.

Mercer Apartment Corp., 80 Fifth Ave., New York 11, N. Y., Separate Contracts, **$927,000,** 6 story APARTMENT, 80-86 Bleecker St., NEW YORK, N. Y. CD 12/31.

Vanderbilt House, 31-53 Steinway St., Long Island City, N. Y., Separate Contracts, **$880,000,** APARTMENT, 48 E. 34 St., NEW YORK, N. Y. CD 12/31.

▲ **Del Balso Constr. Corp. & Delphi Contg. Co., Inc.,** 500 Zerega Ave., New York 61, N. Y., CA **$1,640,000,** HOSPITAL addn., NYACK, N. Y. Nyack Hospital, No. Midland Ave., Nyack, N. Y. Bids Mar. 24. CD 2/29.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $53,000; other public works $88,000; Industrial buildings $110,000; other buildings $400,000. Also Foreign projects of $1,000,000 and more in size of Interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	Middle West
Middle Atlantic	West of Mississippi
South	Far West

PROPOSED WORK

Water Supply	Public Buildings
Sewers, Waste Disposal	Mass Housing
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported n low bidder stage.
CD dates shown are of Construction Daily Issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Construction Daily

For additional reports see Construction Daily.

▲ **Fellow-Brown Contg. Co.,** 1472 Broadway, New York 36, N. Y., CA Est. **$1,000,000,** St. Anthony's SCHOOL and CONVENT, OCEANSIDE, N. Y. Diocese Rockville Centre Bldg. Comn., 253 Sunrise Hy., Rockville Centre, N. Y. Bids Apr. 26. CD 3/29.

▲ **A. Barbaresi & Son, Inc.,** 10 Fiske Pl., Mount Vernon, N. Y., CA **$1,080,330,** QUARTERS for medical staff, incl. medical education bldg., Married Staff Quarters Bldg., Grassland Hospital, VALHALLA, N. Y. Dpt. P. Wks. Westchester Co., County Office Bldg., White Plains, N. Y. Bids Mar. 16. CD 3/18, under LB.

▲ **Nicoloff Homes Corp.,** 1737 Orchard Park Rd., West Seneca, N. Y., Owner Builds, **$2,275,000,** 130 HOMES, Garfield Heights, WEST SENECA, N. Y. CD 5/28/59.

▲ **A. Kerzner, Inc.,** 702 Summit Ave., Jersey City, N. J., CA **$1,000,000,** 52,000 sq. ft. SHOPPING CENTER W. 63 St. and Hudson Blvd., BAYONNE, N. J. Gibraltar Holding Co., c/o S. L. Klein, 17 Academy St., Newark, N. J.

John A. Sarubbi, 415 64 St., West New York, N. J., CA Est. **$400,000,** DOCTOR'S RESIDENCE ADDN., at St. Mary's Hospital, 4 and Willow Sts., HOBOKEN, N. J. St. Mary's Hospital, 4 and Willow Sts., Hoboken, N. J. Brother Cajetam Baremann, 44 Whitehall St., New York, N. Y., archt.

A. Kaplen & Son, 100 Hugenot, Englewood, N. J., LB **$994,700,** general contract 120-unit HOUSING, West 2nd St. and Elmwood Place, NJ 39-2, PLAINFIELD, N. J. Housing Auth., City Plainfield, 543 W. 3 St., Plainfield, N. J. Bids Apr. 28. CD 4/26.

Sellars-Stearns Constr. Co., Montclair, N. J., CA **$405,000,** 2 story, brick, stone SCHOOL ADDN., SUMMIT, N. J. Bd. Trustees Kent Place School, 42 Norwood Ave., Summit, N. J. Bids Mar. 14. CD 3/3.

▲ **A. A. LaFountain, Inc.,** 1761 N. Olden Ave., Trenton, N. J., CA Est. **$1,000,000,** HOSPITAL addns., alterations, TRENTON, N. J. Bd. Trustees Mercer Hospital, 446 Bellevue Ave., Trenton, N. J. Bids Mar. 11. CD 2/4.

▲ **Bechtel Corp.,** 220 Bush St., San Francisco, Calif., Est. CA **$25,000,000-$30,000,000;** design and construct Unit 3, Dickerson POWER PLANT, DICKERSON, MD. Potomac Electric Power Co., 929 E. St. N.W., Wash. 4, D. C. CD 9/9/58.

SOUTH

HEAVY CONSTRUCTION—BA

▲ **La., Morgan City**—BA 6/14—City, City Hall, storm sewers and concrete paving approx. 8 mi. streets, $1,000,000. Brown & Butler, 1225 Nicholson Dr., Baton Rouge, engrs.

▲† **West Virginia**—BA On Or About 6/15—U. S. Eng., 502 8 St., Huntington, Zone 1, 445,000 cu. yd. unclassified excav. 6,300 cu. yd. dumped riprap, etc., Meadow River, Local Protection Proj., East Rainelle, Fayette and Greenbrier Counties, CIVENG-46-022-60-78. $1,000,000. CD 9/15.

BUILDINGS—BA

▲ **Va., Fort Eustis**—U. S. ARMY HOSPITAL—BA 6/16—U. S. Eng., foot of Front St., Norfolk, Zone 1, 3 story, 116-bed, concrete with brick facing hospital; 1 story mechanical equipment bldg., ENG-44-110-60-20. $3,000,000. CD 1/29.

BUILDINGS—SLC

Fla., Miami—SOCIAL CENTER SERVICE—The Salvation Army, 49 NW 5th St., soon lets contract, social center service, NW 23rd St. and Miami Court, $400,000. Carl H. Blohm, 1258 SW 3rd St., archt. Jorgensen & Schreffler, 1200 SW 1st St., structural engr. R. L. Whitman, 25 NW 10th Ave., mechanical engr. CD 4/28.

HEAVY CONSTRUCTION—LB & CA

▲ **ALABAMA**—National Park Service, C St. between 18 and 19 Sts., Wash., D. C.,
Traylor Bros., Inc., Upper Mt. Vernon Rd., Evansville, Ind., CA **$1,267,010** first phase bridge Natchez Trace Parkway across Tennessee River Sheffield. CD 1/20/59.

† **MISSISSIPPI**—Bureau P. Rds., Dpt. Commerce, First National Bank Bldg., Florence, Ala., Bids opened 5/3,
Paul E. Teegarden, P.O. Box 249, Columbus, Ind., LB **$594,646,** (14 bidders), b. conc. pavement, stabilized shoulders and other work from US Hy. 45, 26.987 mi. to Mississippi Hy. 32 at Van Fleet, Natchez Trace Parkway. CD 4/6.

LOUISIANA—State Hy. Dpt., Rm. 426, Headquarters Administration Bldg., Baton Rouge,
Coastal Contractors, Inc., 5842 Perkins Rd., Box 911, Baton Rouge, La., CA **$585,072,** grading, drain., struc. wid'n. existing surf. 13.488 mi. Mer-Rouge Bonita Hy., Rte. 167, SP 16-05-13, Morehouse Parish. Bids Mar. 16, awarded Apr. 4. CD 3/23, under LB.

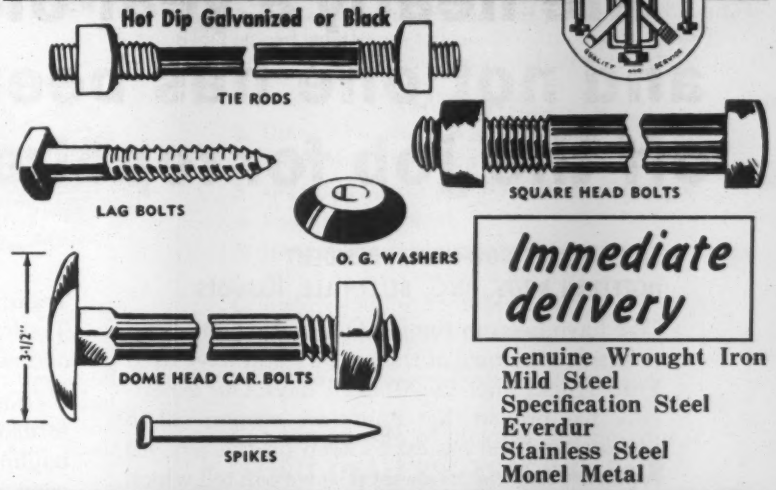
LOUISIANA—State Dpt. Hys., Rm. 426, Headquarters Admin. Bldg., Baton Rouge,
Hall & Holland, Montgomery, La., CA **$677,459,** Castor Creek bridge and Tullas overpass 1.856 mi. Rte. LA-US 84, SP Nos. 22-03-19 and 22-04-10, FAP No. F-197(4), Winn and LaSalle Parishes. Bids Feb. 24, awarded Mar. 2. CD 3/3, under LB.

▲ **KENTUCKY**—Commonwealth of Kentucky, Dpt. Hys., Frankfort,
Greer Bros. & Young, Inc., Hy. 25, London, Ky., CA **$3,037,817,** grade, drain, surf. 4.071 mi. Lexington-Tennessee State Line, I-75-1(3)0, Whitley Co. Bids Apr. 22, awarded Apr. 27. CD 4/26, under LB.

▲ **KENTUCKY**—Commonwealth of Ky., Dpt. Hys., Frankfort, Bids opened May 6,
Talbott Constr. Corp., 30 Wall St., Winchester, Ky.,

(Continued on page 144)

HARDWARE For HEAVY CONSTRUCTION



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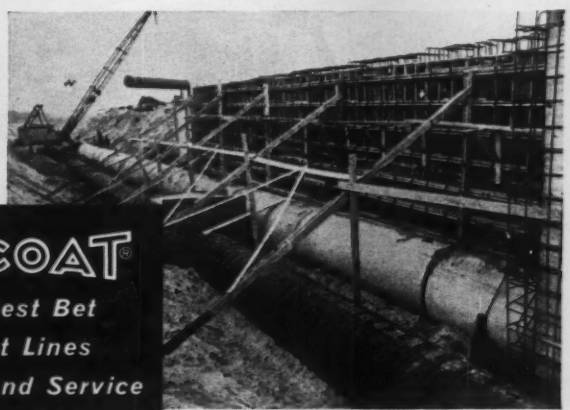

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"We have been in the grading and paving business since the turn of the century and have used Ford Trucks since the Model T days. Our experience has proved that Fords are economical to operate and the easiest to keep on the job. All repairing is done in our shop so we can tell which trucks are the best for us.

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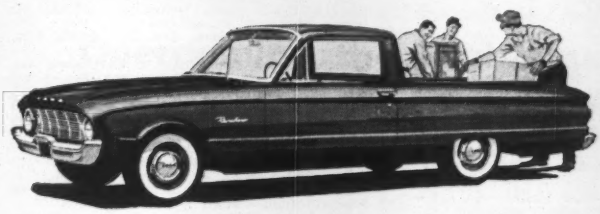

The Falcon Ranchero is priced lower than any pickup in America with comparable standard equipment! And that is just the beginning of your savings. Single-unit construction saves on maintenance . . . it's tighter, quieter, with main underbody structural members zinc-coated against rust and corrosion. Front fenders bolt on, cost less to replace. And Ranchero's passenger-car ride and handling ease lessen driver fatigue.

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Capacity is more than ample for most pickup hauls—nearly 8 feet of load length with tailgate flat. And thanks to the low floor height, loading and unloading is faster, easier!

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*Based on a comparison of latest available manufacturers' suggested retail delivered prices with comparable standard equipment

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Hoeffken's T-800 Fords, with Dumpcrete bodies, are real all-purpose trucks. They can carry up to 14 tons of crushed rock or 5.7 cubic yards of batch concrete.

(Continued from page 141)

LB $2,906,127, (11 bidders) grading draining, bit. surf. 2.985 mi. Lexington-Catlettsburg Rd. and 0.318 mi. Winchester Parish, F-511 (4), I-64-5 (9) 90, Clark Co. CD 4/13.

BUILDINGS—LB & CA

▲ **Glassman Constr. Co., Inc.,** Old Georgetown Rd., Bethesda, Md., CA $1,047,200, ELLEN GLASGOW INTERMEDIATE SCHOOL, off Columbia Pike, west of Bailey's Crossroads, Parklawn, FAIRFAX, VA. Fairfax Co. Bd. Educ., Fairfax, Va. Bids May 4. CD 5/10, under LB.

▲ **Gilbane Bldg. Co.,** 90 Calverly St., Providence, R. I., CA, 2 story, 50,000 sq. ft. RESEARCH CENTER, 1st phase, WIERTON, W. VA. Wierton Steel Co. (subsidiary of National Steel Corp.), Wierton, W. Va. CD 9/24.

Southern Constr., Inc., Old Savannah Rd., Augusta, Ga., CA $771,000, (15 bidders), 100 unit Low Rent HOUSING, Maintenance and Admin. Bldgs., Proj. No. FLA 19-3 and 19-4, COCOA, FLA. Cocoa City Housing Authority, 61 Barlow Homes, Cocoa, Fla. Bids Apr. 19, awarded Apr. 28. CD 4/5, under Fla., Titusville.

Polizzi Constr. Co., 298 Granello Ave., Coral Gables, Fla., LB $561,968, CHAMINADE HIGH SCHOOL, N. 51st Ave. and Polk St., HOLLYWOOD, FLA. Society of Mary Marianists, 6301 Biscayne Blvd., Miami, Fla. Watson & Deutschman, Chamber of Commerce Bldg., Miami, Fla., archt. N. J. Dignum & Assocs., 260 Palermo Ave., Coral Gables, Fla., mech. engrs. Bids Apr. 19. CD 4/20, under LB.

Leach Assn., 207 N. 4 St., Baton Rouge, La., LB $429,942, 50 units low-rent HOUSING, CROWLEY, LA. Housing Auth., Crowley, La. Bids May 3. CD 4/18.

Manson, Smith, McMaster, Box 215, New Orleans, La., CA $472,400, Manor Heights HIGH SCHOOL, GRETNA, LA. Jefferson Parish School Bd., Gretna, La. Bids May 4. CD 4/28;
Perrilliat-Rickey, Box 13128, New Orleans, La., CA $471,600 (3 bidders), Victory Dr. Elementary School (Gretna, La.).

James J. Cullotta, Inc., 712 Berman Walk, Metairie, La., CA $454,004 (11 bidders), 1 story, structural steel frame, brick East End Elementary SCHOOL, GRETNA, LA. Jefferson Parish School Bd., Gretna, La. Bids May 4. CD 4/28.

TUDOR Constr. Co., Box 12323, Alexandria, La., CA $724,565, Unit A, men's RESIDENT HOUSING UNIT, Northeast State College, MONROE, LA. State Bd. Educ., Monroe, La. Awarded Apr. 26. CD 4/27, under LB.

Plant Service Corp., Box 1287, Baton Rouge, La., CA $974,828, CENTRAL PLANT, incl. mechanical and electrical distr. sys. for Louisiana State University, NEW ORLEANS, LA. Louisiana State University, Rm. 204, Administration Bldg., New Orleans, La. Bids Apr. 28. CD 4/18.

William Teater & Sons, Lancaster, Ky., LB $513,000, 2 story, bsmnt. CHURCH, HARRODSBURG, KY. Harrodsburg Baptist Church, Harrodsburg, Ky. Bids May 2. CD 3/31.

H. R. John Constr. Co., E. Broadway, Louisville 4, Ky., CA $692,594, general contract Omer Carmichael ELEMENTARY SCHOOL, LOUISVILLE, KY. Louisville Bd. Educ., 5th and Hill Sts., Louisville, Ky. Bids Apr. 28. CD 5/3, under LB.

▲ **Toledo Engineering Co.,** 2001 Sylvania Rd., Toledo, O., CA design and construct 2 glass melting FURNACES, NASHVILLE, TENN. Ford Motor Corp., American Rd., Dearborn, Mich.

MIDDLE WEST

BUILDINGS—BA

Mich., Fraser—SCHOOL—BA 5/25—Fraser P. Schools, 32101 Caroline St., school. $700,000. Wakely Kushner Assocs., 21429 Mack Ave., St. Clair Shores, archts.

Wis., Madison—APARTMENT—BA 5/26—Wisland Title Corp., 16 N. Carroll St., 8 story, rein.-con. apartment, swimming pool. $400,000. Plans deposit $75. John J. Flad & Assocs., 2525 University Ave., archts.-engrs.

▲ **Wis., Madison**—JUNIOR HIGH SCHOOL—BA 6/2—Bd. Educ., 3 story, bsmnt. Junior High School. $1,750,000. Plans deposit $50. Law, Law, Potter & Nystrom, 121 S. Pinckney St., archts. CD 4/27.

BUILDINGS—SLC

O., Bedford Heights—WAREHOUSE—Seaway Wholesale Grocery Co., 22801 Aurora Rd., soon lets contract 50,000 sq. ft. warehouse addn. $500,000. William Dorsky, 11955 Shaker Blvd., Cleveland, Zone 20, archt. CD 3/22.

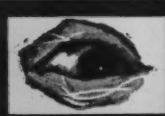
HEAVY CONSTRUCTION—LB & CA

▲ **Charles F. Smith & Sons,** 2600 Far Hill Blvd., Dayton, O., CA $789,555, WW expansion, southern section of pipe line, CANTON, O. City, City Hall, Canton, O. Bids Mar. 1, awarded Apr. 30. Grand total $3,554,635. CD 3/8, under LB;
Oberer Constr. Co., 4324 Webster Ave., Dayton, O., CA $1,527,380, WW expansion, central section of pipe line (Canton, O.). CD 3/8;
H. W. Miller Constr. Co., 1519 Neave St., Covington, Ky., CA $611,700, WW expansion, general contract (Canton, O.);
Bohrer Constr. Co., Centralia, Ill., CA $623,000, Contract No. 2, mechanical, WW expansion (Canton, O.). CD 3/4.

▲ **Arcole Midwest Corp.,** 3225 Main St., Skokie, Ill., CA $2,407,426, No. 066-1516.1-CP, c. conc. pavement dual 48 ft. lane, South Rte. Expressway; CA $1,957,867, No. 066-1717-CF, c. conc. paving two 48 ft. lanes, South Rte. Expressway; CA $1,561,598, No. 066-1818-CF, c. conc. paving dual 48 ft. lane, South Rte. Expressway, 11,252 ft. 8- to 24-in. storm sewers, CHICAGO, ILL. Bd. Comrs. Cook Co., County Bldgs., Chicago 2, Ill. Bids Apr. 5, awarded May 3. Grand total $6,631,634. CD 4/8, under LB;
W. J. Sheppard & Co., 1412 W. Altgeld St., Chicago, Ill., CA $704,743, No. 066-1919-CF c. conc. paving dual 48 ft. lane South Rte. Expressway, curb and gutter, 3,906 ft. 8- to 24-in. storm sewers (Chicago, Ill.).

▲ **Arcole Midwest Corp.,** 3225 Main St., Skokie, Ill. LB $194,977, est. $160,000, (4 bidders), No. 106-0102, 108-0304.1, 111-0909, 047-0707, 230-0102-121-0707.1 bit. paving Walters Ave., Tower Rd., Illinois Rd. Locust Rd. and Church St., Skokie, CHICAGO, ILL. Bd. Comrs. Cook Co., County Bldg., Chicago 2, Ill. Bids May 3, CD 4/22;
Gallagher Asphalt Corp., 181st St. and Indiana Ave., Thornton, Ill., LB $246,896 est. $193,750 (5 bidders) No. 043-0607.1, 176-1415.1, 054-1010.3, 195-0102.2, bit. paving, crushed stone shoulders, Ridgeland Ave., 111th St., Ridge Rd., Worth (Chicago, Ill.);
Rock Road Constr. Co., 5915 N. Rogers Ave., Chicago, Ill., LB $155,887, est. $155,000, No. 100-0811, 082-0506.2, bit. paving, crushed stone shoulders, Lake-Cook Rd. and Mt. Prospect Rd., Des Plaines (Chicago, Ill.);
Allied Asphalt Paving Co., Harrison and Manheim Rd., Hillside, Ill., LB $372,649, est. $386,000, (6 bidders), No. 133-0103, bit. paving 2.88 mi. West Bartlett Rd. (Chicago, Ill.);
Standard Paving Co., 300 W. Washington St., Chicago 6, Ill. LB $151,880, est. $120,000, (6 bidders), No. 138-0808.3, 130-2326.2, bit. paving 2.85 mi. Bryn Mawr and Avondale Aves. (Chicago, Ill.);
Seneca Petroleum Co., Inc., 3258 S. Canal St., Chicago, Ill., LB $145,969, est. $124,500, (6 bidders), No. 141-0304.3, 021-0202, 022-0707.1, 142-0102, 217-1010.1, bit. paving 3.09 mi. Des Plaines Rd., Forest Preserve Dr. and Oak Park Ave., Schiller Park, (Chicago, Ill.);
George Hartong, Inc., 340 Sherwood Ave., LaGrange Park, Ill., LB $147,403, est. $115,000 No. 033-0102.2, 031-0101.1, 022-0203.1, 158-0303.1, bit. paving First Ave., Fifth Ave. and 26th St. Maywood (Chicago, Ill.);
Milburn Bros., Inc., Central Rd., Mt. Prospect, Ill., LB $659,584, est. $450,000 (7 bidders), No. 115-0103.1, c. conc. road paving 11,503 ft. 10- to 30-in. storm sewers, 16,955 ft. curb and gutters, Des Plaines, (Chicago, Ill.);
J. P. Constr. Co., 1750 State St., Chicago Heights,

(Continued on page 146)



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news and notes from the field

Overcoming the Problems of Hot Weather Concreting

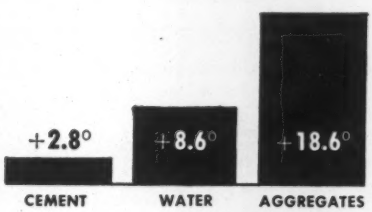
Hot weather can be made to work *for* you in concreting—if certain precautions are observed during placing. The dangers of inadequate preparation before placing, high MIX temperatures and poor curing protection should be understood and controlled.

Effects of High Temperatures

High temperature accelerates the setting time of concrete and promotes rapid evaporation of moisture. The setting time is based on mix and curing temperatures of 73°F. As the temperature rises the setting time accelerates. When the temperature of the concrete is allowed to climb too high, there is danger of "quick set" and permanent strength damage.

What causes High Concrete Temperatures?

The temperature of fresh concrete is affected by the temperature of the materials and the mixing conditions. Take an average five bag mix and increase the temperature of each ingredient 30°. The graph below shows how much each affects the concrete temperature.



What Happens When Temperature of Fresh Concrete Runs Too High

- Permanent strength reduction
- Early stiffening or quick set
- Increased water requirements
- Increased probability of cracking

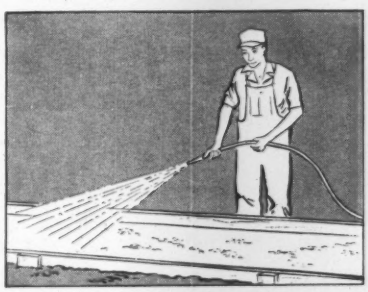
Reprints Available

If you would like free reprints of this helpful information on Hot Weather Concreting, contact your local Alpha representative or the Alpha Portland Cement Company, Easton, Pa.

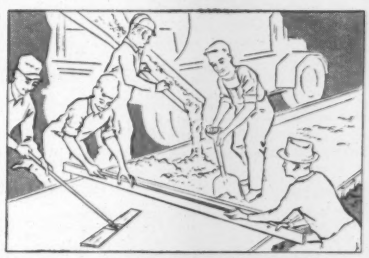
Ways of Reducing Mix Temperature:

1. Sprinkle hot aggregate stock piles with hose or fog spray.
2. Apply fog spray to aggregates or conveyor belts.
3. Use crushed ice in the mix replacing water—pound for pound.
4. Avoid stock-piling aggregates directly in the sun.
5. Protect mix-water storage and lines from direct sun.
6. Avoid the use of strength accelerators in hot weather.

Tips For Best Results



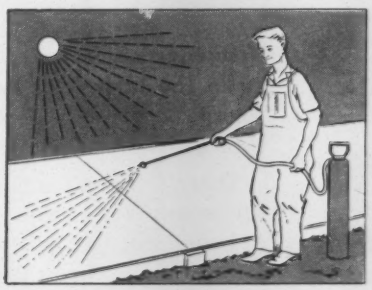
1. Subgrade should be damp (not muddy) so it will not absorb water from concrete.



2. Have adequate help available to handle concrete rapidly.

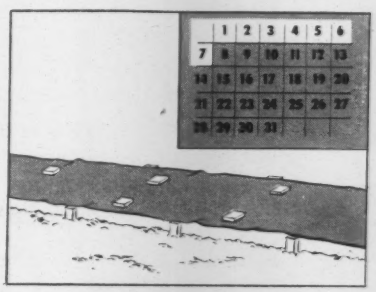
3. Discharge MIX as soon as possible after proper mixing.

4. In extremely hot weather it may be necessary to shade concrete or use wet coverings until final finishing can be completed.



5. In hot dry breeze erect wind break or use fog nozzles on upwind side of fresh concrete.

6. Start curing operations as soon as concrete has set enough to avoid surface damage.



7. Cure concrete for at least 7 days where durable wearing surface and strength are important.

8. Keep test cylinders shaded and damp until they are ready to be sent to laboratory after 24 hours.

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(Continued from page 144)

Ill., LB **$1,269,687**, est. $932,000, (6 bidders), No. 062-0205-CF 42 ft, wid'n., bit. resurf. Chicago Rd., Thornton, (Chicago, Ill.).

▲ **Herlihy Mid Continent Co.**, 407 S. Dearborn St., Chicago 5, Ill., CA **$751,882**, No. 068-2323.1-CF, 2-tube precast, prestressed concrete box beam top, rein.-con. wall tunnel, South Rte. Expressway, CHICAGO, ILL. Bd. Comrs, Cook Co., County Bldg., Chicago 2, Ill. Bids Apr. 5, awarded May 3. Grand total $4,508,056. CD 4/8, under LB;
E. J. Albrecht Co., 2626 W. 26th St., Chicago, Ill., CA **$2,167,413**, No. 066-1616.3 CF, three, steel 5-span railroad grade separations (Chicago, Ill.);
Chicago Heights Steel Co., 1632 Wentworth Ave., Chicago Heights, Ill., CA **$1,588,761**, No. 066-1616. 3F-CF, furnish, fabricate, deliver steel for three railroad grade separations, South Rte. Expressway (Chicago, Ill.).

William Adams Engineers Inc., 3911 W. North Ave., Chicago, Ill., LB **$807,687** (6 bidders), YYA, mechanical equipment and piping for wet oxidation plant, West Southwest Sewage Treatment Works, Stickney, CHICAGO, ILL. Metropolitan Sanitary Dist. of Chicago, 100 E. Erie St., Chicago, Ill. Bids Apr. 28. CD 1/14.

▲ **MICHIGAN**—State Hy. Dpt., 732 Mason Bldg., Lansing,
Mich.—**Sargent Constr. Co.**, 2840 Bay Rd., Saginaw, Mich., CA **$2,004,093**, grading, drainage structures 2.9 mi., 3 bridges U.S. 16, Kent Co.; CA **$2,642,746**, grading, drainage structures 5 mi. 4 bridges US-23, Saginaw Co.;
Mich.—**L. W. Edison Co.**, 3134 Midland Dr. S.E., Grand Rapids, Mich., CA **$3,181,436**, grading, drainage structures 2.5 mi., 4 bridges US-16, Kent Co.;
Mich.—**Carl Goodwin & Sons, Inc.**, 500 Delano St., Allegan, Mich., CA **$3,346,884**, grading, drainage structures 6.2 mi., 10 bridge structures, US-16, Kent and Ottawa Counties;
Mich.—**L. A. Davidson**, 213 E. St. Joseph St., Lansing 33, Mich., CA **$3,075,526**, grading, drainage structures 4.1 mi. 4 bridge structures, US-23, Saginaw Co.;
Mich.—**C. F. Replogle Co.**, Circleville, O., CA **$2,265,177**, grading, drainage structures 7 mi., 2 bridge structures, M-78, Shiawassee Co.;
Mich.—**Denton Constr. Co.**, 20415 Mack Ave., Grosse Pointe Woods, Mich., CA **$2,541,707**, grading, drainage structures 5.2 mi., 3 bridge structures, M-78, Shiawassee Co.;
Mich.—**Pierson Contg. Co.**, 200 Eddy Bldg., Saginaw, Mich., CA **$2,186,751**, grading, drainage structures 5.1 mi., 4 bridges US-12, Washtenaw Co. Grand total $21,244,320. Bids Apr. 27, awarded May 3. CD 5/4, under LB.

BUILDINGS—LB & CA

▲ **Miami Valley Constr. Co.**, 333 W. 1st St., Dayton 2, O., CA **$1,200,000**, 2 story OFFICE ADDN., 150 car PARKING GARAGE, 333 W. 1st St., DAYTON, O. Norman Miller & Assocs., 333 1st St., Dayton, O. CD 7/9.

▲ **Leonard Homes, Inc.**, Chester-12th Bldg., Cleveland 14, O., Own Forces, **$1,875,000**, 75 HOMES, Barkston Park Estates, Rose Blvd., HIGHLAND HEIGHTS, O. Philip Wasserstrom, Chester-12th Bldg., Cleveland 14, O., archt.

▲ **Iris Constr. Co.**, 23218 Greenlawn St., Cleveland 21, O. Own Forces, **$1,150,000**, 75 HUDSON VIEW HOMES, Walters Rd., HUDSON, O. Nathan Berstein, 1991 Lee Rd., Cleveland 18, O., archt.

▲ **Knowlton Constr. Co.**, Box 254, Bellefontaine, O., CA **$3,060,100**, general contract Phase III, Correctional INSTITUTION, incl. 6 cellblocks, workshop, gymnasium, laundry, road, fence, drainage, Lebanon Correctional Institution, LEBANON, O. Dpt. P. Wks., State Depts. Bldg., Columbus 15, O. Bids Apr. 26. CD 4/29, under LB;
Sam Wallace & Co., 1015 Vine St., Cincinnati, O., CA **$479,912**, plumbing and drainage contract for Correctional Institution (Lebanon, O.).

▲ **Mosser Constr. Co.**, 122 S. Wilson Ave., Fremont, O., CA **$1,036,600** (23 bidders), HIGH SCHOOL, MAUMEE, O. Bd. Educ., Maumee, O. Bids Apr. 29. CD 4/7.

▲ **Foster Wheeler Corp.**, 666 5th Ave., New York, N. Y., CA Est. **$3,600,000**, design and construct 10,500 bbl. per day propane de-asphalting REFINERY, incl. three towers each 9 ft. diam., 70 ft. high enclosing rotating disc contactors, TOLEDO, O. Sun Oil Co., 1601 Woodville Rd., Toledo, O.

Repp & Mundt, 1604 Cottage Ave., Columbus, Ind., CA **$905,000** (7 bidders), JUNIOR HIGH SCHOOL and swimming pool, COLUMBUS, IND. City School Comn., 601 Pearl St., Columbus, Ind. Bids Apr. 7, awarded Apr. 26. CD 4/13, under LB.

Superior Constr. Co., Inc., 1900 E. 7 St., Gary, Ind., CA **$527,700**, Edison HIGH SCHOOL ADDN., EAST GARY, IND. East Gary School Bldg. Corp., 2295 Park Ave., East Gary, Ind. Bids Mar. 17, awarded Apr. 20. CD 3/31, under LB.

▲ **Grewe Contractors, Inc.**, 2524 E. Pontiac St., Fort Wayne, Ind., CA Est. **$1,000,000**, SHOPPING CENTER, paved parking, Nuttman and Brooklyn Aves., FORT WAYNE, IND.

L. G. Arnold, Inc., P.O. Box 228, Eau Claire, Wis., CA **$520,516**, general contract YMCA, EAU CLAIRE, WIS. Young Men's Christian Assn., 101 S. Farwell St., Eau Claire, Wis. Bids Mar. 23. CD 4/19, under LB.

▲ **Korndoerfer & Salvano, Inc.**, 1415 Hampden Place, Racine, Wis., LB **$1,738,000** (4 bidders), general contract Cordelia Harvey and Jane Vernon ELEMENTARY SCHOOLS, KENOSHA, WIS. Bd. Educ., 5515 Sheridan Rd., Kenosha, Wis. Bids May 3. CD 3/22.

(Continued on page 150)

Designed, fabricated and erected to stop

LEAKAGE

before it starts...

Here's how—

SPECIFY and INSTALL any one of the ten (10) BAYLEY curtain-wall systems and you are assured of:

1. **Adequate breathers and weeps scientifically positioned.**
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And equally important — when we work with you on the development of the design, the details will provide for:

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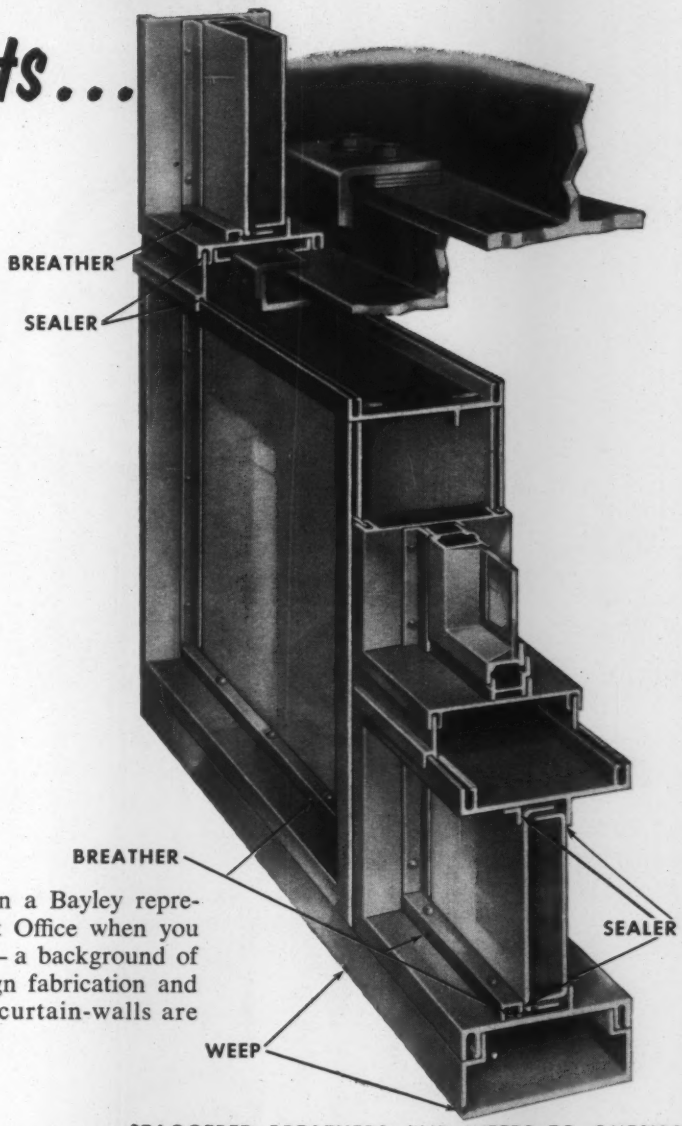

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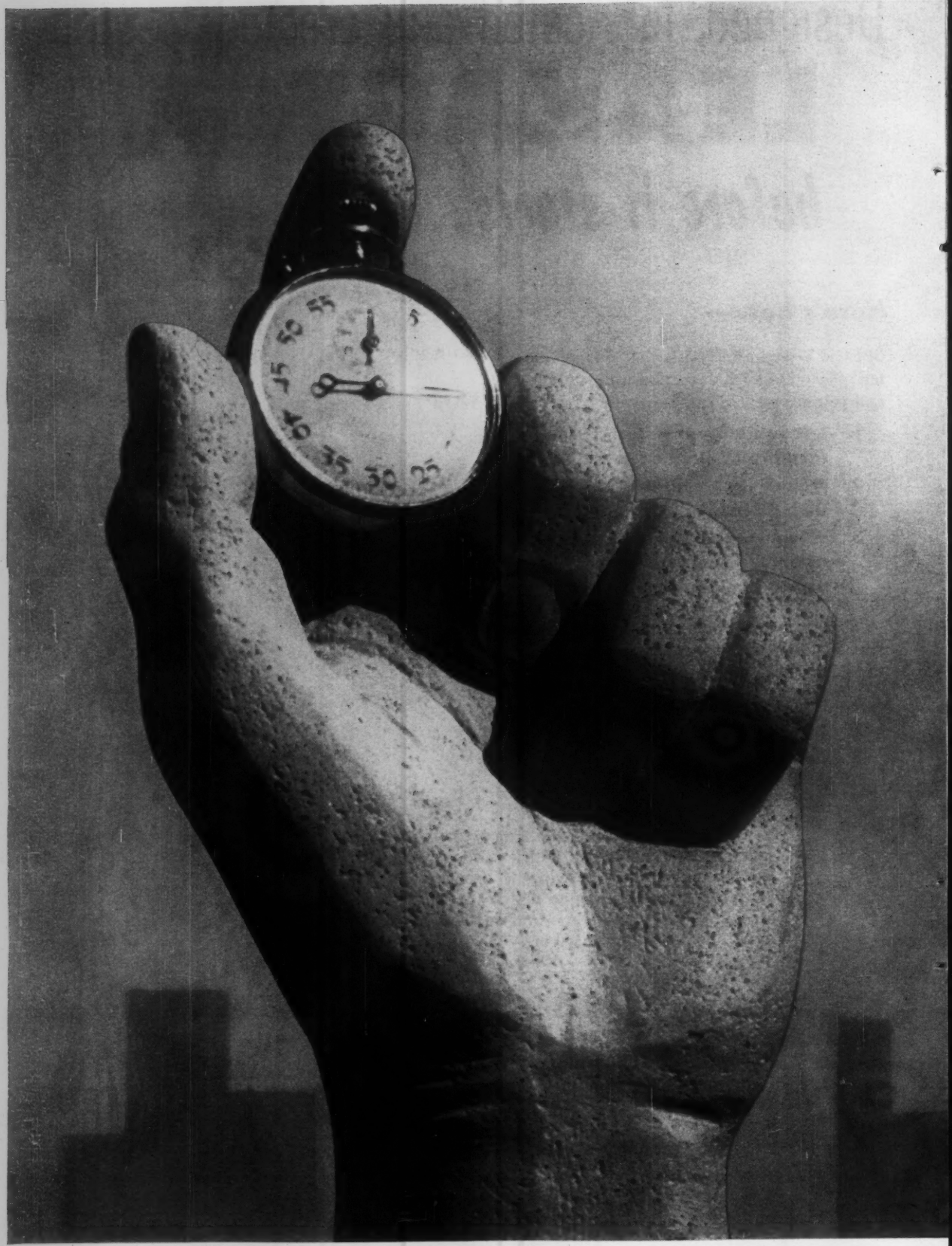
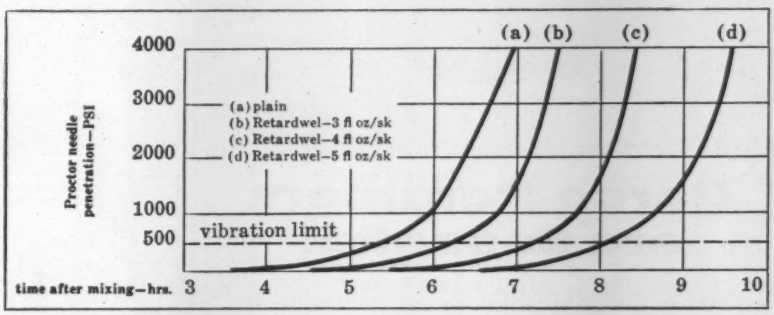


Control concrete setting time with J-M Retardwel

...the hot weather admixture that gives up to 50% higher 24-hour strength.

Retardwel®, a product of Johns-Manville, world's largest industrial user of portland cement, is the liquid admixture that controls concrete setting time and prevents premature stiffening due to high temperatures *without* loss of early strength.

Retardwel permits a reduction in the water required for proper placing and provides all the advantages of concrete fabricated with a minimum paste content. Its use delays the initial set of concrete and provides a slower rate of heat evolution, thereby minimizing thermal stresses. Therefore, the use of Retardwel will aid in eliminating shrinkage cracks. Only 3 ounces of Retardwel per sack of cement will control setting time (see chart) and still increase 24-hour strength as much as 50%.



Retardwel's unique properties will also—

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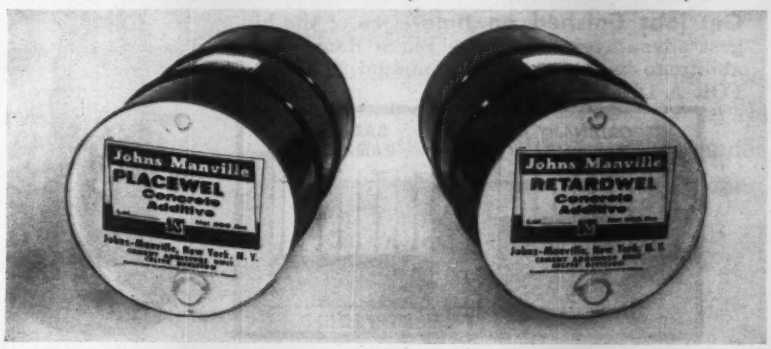
■ Increase workability ■ Reduce permeability ■ Increase density

For normal weather conditions, J-M Placewel® is recommended. Johns-Manville's two concrete admixtures have gained the acceptance of architects and engineers throughout the world. For full information write: Johns-Manville, Box 14, New York 16, N. Y.



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Tamping fill around 4 ft. concrete pipe culvert on New York State Thruway Extension near West Seneca, N.Y. The Barco Rammers are owned by S. J. Groves & Sons Co., Syracuse, N.Y.
(Photo: CONSTRUCTIONEER)

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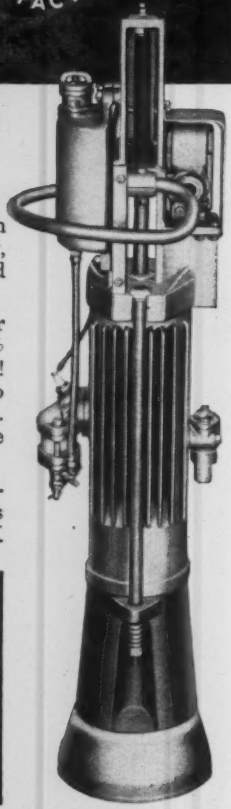

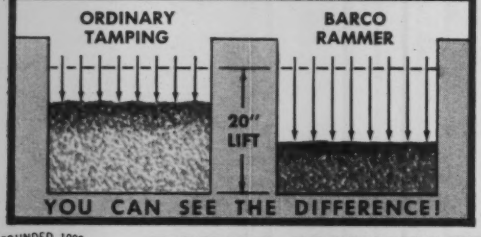

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(Continued from page 146)

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

▲ **S. D., Sioux Falls**—FIELD HOUSE—BA 6/1—City, City Hall, 265 x 280 ft., 68 ft. steel arch roof field house, heating plant. $1,400,000. Harold Spitznagel & Assoc., 1800 S. Summit, archts. CD 4/6.

▲† **N. M., Roswell** — OPERATIONAL BASE MISSILE LAUNCH COMPLEXES—BA 6/15—U. S. Eng., P.O. Box 1538, Albuquerque, 12 WS-107A-1 operational base missile launch complexes, each consisting of rein.-con. silo, launch control center bldg., access roads, utilities, Walker Air Force Base, ENG-29-005-60-92. $10,000,000. Plans deposit $10. CD 5/4.

▲† **Tex., Lackland Air Force Base**—TRAINING BUILDING—BA About 6/16—U. S. Eng., P.O. Box 1229, Galveston, technical training general building, Lackland Air Force Base, ENG-41-243-60-38. $1,000,000. CD 4/13.

BUILDINGS—BA

▲ **Colo., Fort Collins** — HOUSING — BA 5/26 — State Planning Div. State Capitol Bldg., Denver, 1 and 2 story Married Students Housing, Colorado State University. $1,300,000. James M. Hunter, 1126 Spruce St., Boulder, archt. CD 4/23.

Kan., Medicine Lodge—SCHOOL—BA 5/26—Rural High Scshool Dist. No. 7, Medicine Lodge, high school. $700,000. Hibbs & Pettit, 254 N. Washington St., Wichita, archts. CD 1/28.

Tex., Lubbock—LIBRARY—BA 5/27—Texas Technological College, Lubbock, library, Over $750,000, plans deposit $100, Pitts, Meband & Phelps, 1872 Calder Ave., Beaumont, archts., CD 7/25/57; utilities extens. camp area, $150,000, plans deposit $25, Zumwalt & Vinther, 2109 Ave. Q, engrs. CD 3/18/58.

Minn., Anoka—COURT HOUSE ADDN.—BA 5/31—Anoka Co. Court House, 106 x 162 ft. court house addn. $700,000. Plans deposit $20. Patch & Erickson, 2815 Wayzata Blvd., Minneapolis, archts. CD 9/30.

▲ **Tex., San Antonio**—HEADQUARTERS, etc.—BA 6/7—City, City Hall, police headquarters-corporation court. $1,248,000. Plans deposit $50. Noonan & Thompson & Krocker, 2002 N. St. Mary's St., archts. CD 6/12.

Tex., Houston—PLANT—Bids Asked—Owner, c/o Wyatt C. Hedrick, archt. engr., 5201 Fannin St., industrial plant. $400,000. CD 5/5.

▲ **Tex., Texas City**—ALKYLATION REFINERY UNIT—Bids Asked—American Oil Co., Texas City, (selected list of bidders), alkylation refinery unit, $18,000,000. CD 5/3.

BUILDINGS—SLC

Minn., Roseville — TERMINAL — Haarstick-Lundgren & Assocs., archts., N. 212 First Natl. Bank Bldg., St. Paul, soon lets contract, terminal, County Rd. C near Hy. 8, for Central Wisconsin Motor Transport Co., 200 Sixth Ave. S.E., Minneapolis, Minn. Est. $500,000. CD 11/6.

HEAVY CONSTRUCTION—LB & CA

▲ **MINNESOTA**—State Hy. Dpt., State Hy. Bldg., St. Paul,

Johnson Bros. Hy. and Heavy Constructors, Inc., 5201 US Hy. No. 169, Minneapolis 26, Minn., CA **$1,843,995**, grade, base, bit. surf. and bridges 2.9 mi. Hennepin Co. Bids Apr. 22. CD 4/26, under LB.

Eian & Ness, Box 605, Fergue Falls, Minn., and **M. J. McGough Co.**, 1954 University Ave., St. Paul, Minn., GA **$731,467**, water treatment plant addns., FERGUS FALLS, MINN. City, City Hall, Fergus Falls, Minn. Bids May 22. CD 3/31, under LB.

† **C. F. Bower Constr. Co.**, 115 S. 8 St., Nebraska City, Neb., CA **$609,098**, est. $538,271 (5 bidders), repairing dikes and revetment, Missouri River, Little Sioux-Bullard Bends, CIVENG 26-066-60-81, IOWA-NEBRASKA. U. S. Eng., 1709 Jackson St., Omaha 2, Neb. Bids Apr. 21, awarded May 2. CD 4/27, under LB.

▲ **IOWA**—State Hy. Comm., Ames, Bids opened 5/3,

Iowa—**Booth & Olson, Inc.**, 529 Ins. Exch. Bldg., Sioux City, Iowa, LB **$248,809**, c. conc. paving 6.877 mi. S-218 (3), Crawford Co.; LB **$141,523**, c. conc. paving 4.752 mi. S-578 (9), Crawford Co.; LB **$253,897**, c. conc. paving 6.97 mi. S-1305 (3), Crawford Co.; LB **$959,560**, c. conc. pavement wid'n. 15.991 mi. F-292 (3), Clinton Co.; LB **$90,033**, c. conc. pavement wid'n. 1.99 mi., F-21 (2), Jackson Co.;

Iowa—**Concrete Materials & Constr. Co.**, P. O. Box 790, Cedar Rapids, Iowa, LB **$480,057**, b. conc. paving F-956 (4), Johnson and Muscatine Counties; LB **$104,560**, b. conc. resurf. 6.616 mi. F-5 (5), Buchanan Co.; LB **$138,947**, b. conc. resurf. 6.97 mi., FN-5, Buchanan Co.; LB **$139,592**, b. conc. resurf. 8.28 mi., P-1072, Delaware Co.;

Iowa—**Irving F. Jensen Co.**, 2220 Hawkeye Dr., Sioux City, Iowa, LB **$562,744**, c. conc. paving 1.14 mi., U-9 (8), Johnson Co.;

Iowa—**John P. Abramson Constr. Co.**, P. O. Box 2008, Des Moines, Iowa, LB **$992,947**, c. conc. pavement, and b. conc. resurf. 0.536 mi. on Freeway, and 0.513 off Freeway, 1-235-2 (24) 79, Polk Co. CD 4/20.

▲ **MISSOURI**—State Hy. Comn., Jefferson City, Bids opened 4/29,

Mo.—**Illinois Valley Constr. Co.**, 850 Broadway, Keokuk, Iowa, LB **$618,261**, (4 bidders), graded earth, traffic signals 1.04 mi., Randolph Co., LB **$675,038**, (5 bidders), graded earth, traffic signals 4.538 mi. Randolph Co.;

Mo.—**Peter Kiewit Sons Co.**, 1525 S. Glenstone, Springfield, Mo., LB **$620,604**, (7 bidders), graded earth, culverts and concrete pavement 2.038 mi. Lawrence

(Continued on page 152)

A-M Flat-Base Pipe used in $120,000,000 expansion of Chicago's O'Hare Field

Contractor for installation of this A-M Flat Base watermain gallery: S. J. Groves, Chicago; Architects-Engineers: Naess & Murphy, Chicago.

Utility tunnel designed to withstand 100,000 lb. jet wheel loading

A jet landing strip must necessarily be level—virtually free of dips and cracks. That's why A-M Flat Base Pipe was used for a watermain gallery beneath O'Hare Field's runways as part of its multi-million dollar modernization program—because A-M Concrete Flat Base Pipe has the necessary *rigidity* to resist sagging and tight joints to prevent infiltration. The result is a *dry* utility tunnel —a *strong* tunnel designed to withstand 100,000 lb. jet wheel loadings with complete safety.

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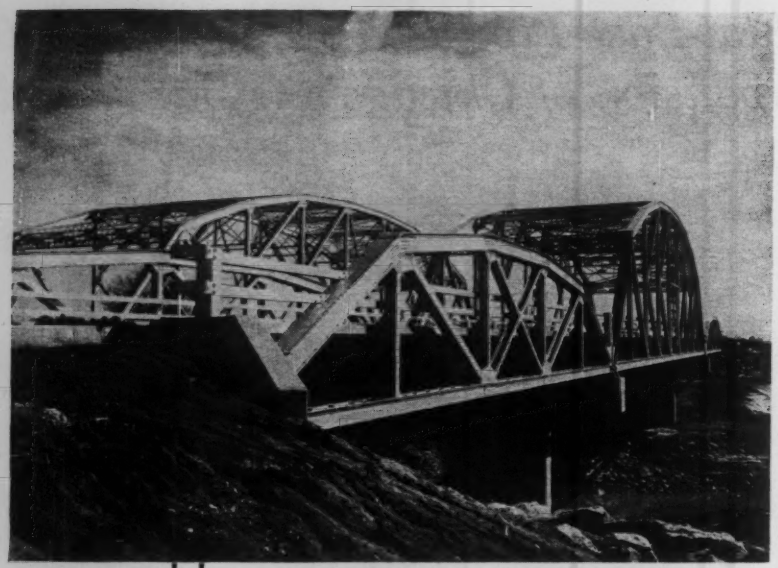

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(Continued from page 150)

Co.; LB **$2,372,694**, (8 bidders), graded earth, culverts 8.322 mi. Greene Co.; LB **$1,627,449**, (9 bidders) graded earth, culverts 4.555 mi. Greene Co.;

Mo.—**Joseph L. Pohl Contr.**, Nevada, Mo., LB **$806,048**, (7 bidders), graded earth, culverts 6.244 mi. Lawrence Co. CD 4/7.

† **Eugene Luhr**, Columbia, Ill., and **Markham & Brown**, 1961 N. Industrial Blvd., Dallas, Tex., LB **$463,123**, (3 bidders), repair, constr. dikes and revetment, Missouri River, Hermann Reach to Weldon Springs Bend, CIVENG-23-028-60-64, MISSOURI. U. S. Eng., 1800 Federal Office Bldg., Kansas City 6, Mo. Bids May 3. CD 3/31.

▲† **Al Johnson Constr. Co.**, 608 Foshay Tower, Minneapolis, Minn., and **Peter Kiewit Sons Co.**, 1024 Omaha Nat'l. Bank Bldg., Omaha, Neb., LB **$6,897,840**, est. $7,961,628 (17 bidders), Dardanelle Dam overflow section, Arkansas River, Dardanelle, CIVENG-03-050-60-53, ARKANSAS. U. S. Eng., Gay Bldg., Little Rock, Ark. Bids May 5. CD 2/26.

† **Electrical Constr. Co.**, Box 2178, Columbus, O., LB **$761,060**, est. $841,642, (13 bidders), Fort Thompson substation, Stage 01, Missouri River Basin Proj., Spec. DC 5295, SOUTH DAKOTA, Bureau Reclamation, Dpt. Interior, Huron, S. D. Bids May 3. CD 3/25.

▲† **Jansen Constr. Co., Inc.**, 1203 Powhattan St., Dallas, Tex., CA **$1,048,000**, Air National Guard hangar and facilities, DALLAS, TEX. Officer in Charge of Constr., 8th Naval Dist., Bldg. 16, U. S. Naval Station, New Orleans, La. Bids Mar. 17. CD 4/15, under LB.

▲ **NEW MEXICO**—State Hy. Comm., State Hy. Dpt. Bldg., Cerrillos Rd., Santa Fe,

N. M.—**J. W. Jones Constr. Co.**, P.O. Box 8038, Albuquerque, N. M., CA **$1,635,631**, est. $1,767,048, Coal Ave. to Miles Rd., Albuquerque, Proj. No. I-025-4(13)219 I 25, Bernalillo Co.; CA **$541,255**, est. $655,776, US 60 and US 84, Fort Sumner East and North, Proj. No. F-027-2(5) and S-1245(1), De Baca Co.;

N. M.—**Longenbaugh & Coe, Inc.**, P.O. Box 6056, Albuquerque, N. M., CA **$1,731,288**, est. $1,801,468, West of McCarty West, Proj. No. I-040-2(2) 90 I-40, Valencia Co.; CA **$1,012,545**, est. $1,062,480, McCarty West, Proj. No. I-IG-040-2(12)95 I-40, Valencia Co.;

N. M.—**Dan-D Constr., Skousen Constr. and D. D. Skousen & Son**, 208 Springer Bldg., Albuquerque, N. M., CA **$423,014**, est. $441,723, US 260 Central-Bayard, Proj. No. F-013-1(5), Grant Co.;

N. M.—**Armstrong & Armstrong**, P.O. Box 873, Roswell, N. M., CA **$474,428**, est. $507,593, US 54 and US 70, Tularosa-Urban, Proj. No. F-020-1(8) and F-021-1(5), Otero Co., all foregoing CD 4/26;

N. M.—**Daniel's Constr. Co.**, 1412 Broadway N.E., Albuquerque, N. M., CA **$94,545**, est. $101,246, sealing US 66 and US 666, Proj. No. SP-3-60(603), McKinley and San Juan Counties;

N. M.—**Harry Trotz Constr. Co.**, 704 Solar Rd. N.W., Albuquerque, N. M., CA **$196,175**, est. $218,531, sealing Proj. No. SP-3-60(604), Bernalillo, Valencia and Sandoval Counties;

N. M.—**Skousen-Hise Contr. Co.**, 208 Springer Bldg., Albuquerque, N. M., CA **$215,946**, est. $257,648, sealing Proj. No. SP-4-60(603), vicinity of Las Vegas, San Miguel and Mora Counties, foregoing CD 5/2. Bids May 3. Grand total $6,324,827.

BUILDINGS—LB & CA

McGough Constr. Co., 2711 N. Fairview Ave., St. Paul, Minn., LB **$424,000** (9 bidders), 1 story Lakeaires ELEMENTARY SCHOOL, WHITE BEAR LAKE, MINN. Bd. Educ., Independent School Dist. No. 624, White Bear Lake, Minn. Bids May 3. CD 4/22.

▲ **Dickie Constr. Co.**, 317 N. 11 St., St. Louis 1, Mo. CA **$1,768,462**, Base Bid, general contract RELIGIOUS FACILITIES, Ladus and Spoede Rds., CREVE COEUR (ST. LOUIS 41, P. O.), MO. Temple Israels Congregation, 5017 Washington Blvd., St. Louis 8, Mo. Bids Feb. 9. CD 2/16, under LB.

▲ **Hankins Constr. Co.**, 7818 Forsyth Blvd., Clayton 5, Mo., CA **$1,239,939**, general contract, brick, masonry blocks steel concrete JUNIOR HIGH SCHOOL Waterford Dr. near Parker Rd., Florissant, FERGUSON (St. Louis 35 P.O.) MO. Ferguson-Florissant School Dist. R-2, 655 January Ave., Ferguson 35, Mo. Bids May 4. CD 4/15.

The Baldwin Co., 322 Gaines St., Little Rock, Ark., CA **$571,295**, est. $550,000 (5 bidders), 2 DORMITORIES, ARKADELPHIA, ARK. Ouachita Baptist College, Arkadelphia, Ark. Bids May 4, awarded May 4. CD 4/13.

▲ **Block Realty Co.**, 212 Spring St., Little Rock, Ark., Owner Builds, **$1,500,000**, 118-HOUSES subdivision, Ellis Acres, West Markham St. west of Rodney Parham Rd., LITTLE ROCK, ARK.

▲ **Winrock Enterprises**, 207 W. 2 St., Little Rock, Ark., Owner Builds, **$1,750,000**, 118-HOUSES subdivision Broadview, Scenic Hill, NORTH LITTLE ROCK, ARK.

S. P. Nesmith, Frontier Village, 1241 Grand Ave., Abilene, Tex., Owner Builds, **$425,000**, SHOPPING CENTER, ABILENE, TEX. CD 2/18.

L. A. Peterson, Contractor, 7135 Empire Freeway, Dallas, Tex., CA **$448,000**, two 36-lane (each) BOWLING ALLEYS, GARLAND, TEX. Owner, c/o Donald Speck, archt., 425 S. Field St., Dallas, Tex. CD 5/6.

Edna Kelly Building Co., 7030 Carvel St., Houston, Tex., Owner Builds, **$429,500**, 33 DWELLINGS; **$410,345**, 30 DWELLINGS, Sharpstown, HOUSTON, TEX. CD 5/2.

▲ **Harvey Houck & Son, Houck Enterprises**, 3701 Bluebonnet St., Houston, Tex., Owner Builds, **$1,790,000**,

(Continued on page 156)

PEERLESS PUMPS

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Why the Aqua Line for your job?

Fast, Easy Installation—Peerless AquaLine pumps install quickly in new or existing systems. No special tools are required. Take it out of the package and put it to work.

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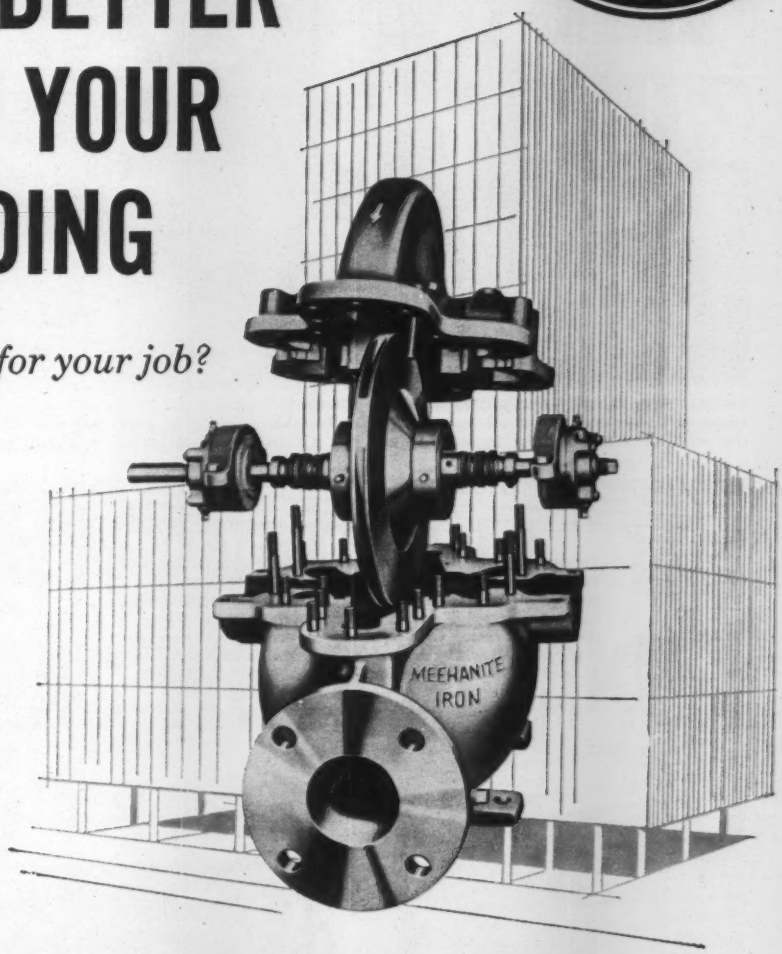
Low in Cost, High in Quality—Peerless AquaLine pumps are engineered with the same high-quality traditionally found only in more expensive units. Yet this pump is priced right. Get the facts. Send for Bulletin B-2100 today.



FOR EFFICIENT DEPENDABLE WATER HANDLING SPECIFY THE NEW PEERLESS *Aqua Line* PUMP

AquaLine Characteristics:

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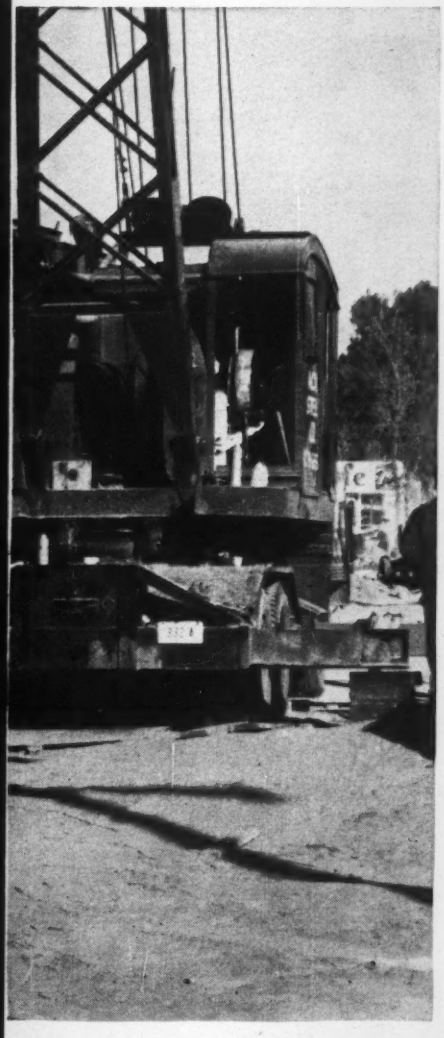
Six-passenger capacity, plus pickup body—the Travelette® takes work crews and their equipment all in one trip. Comfortable, full-width rear seat has curbside door for easy in and out. Chassis and 6-ft. standard or Bonus-Load pickup body are factory matched and factory mounted. Travelette models handle gross loads up to 8,800 lbs. You get "dual versatility" for one price. Optional four-wheel drive.

Tailor-made for hard work and heavy loads, INTERNATIONAL stake models have heavy-duty brakes and springs for long life on rough jobs. Wide cab seats three men comfortably. True-truck V-8 engines up to 197 hp. move loads faster, with welcome gas economy. Choice of regular or all-wheel drive, factory-installed stake bodies from 8 to 16 ft. long. Models up to 33,000 lbs. GVW.

"Hotshot" small loads, big men around the job in an INTERNATIONAL pickup. Comfortable cab has 5 ft. wide seat, extra headroom. Choice of standard all-steel bodies (shown) or optional Bonus-Load bodies up to 8½-ft. long. 266 cu. in. V-8 engine gives outstanding gas mileage. Sweep-Around windshield has no "knee-skinning" doorway projections. Four-wheel drive available, too.



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Here are three reasons for you to think of *and look into* INTERNATIONAL when you want light and medium-duty trucks that do many jobs well over many years.

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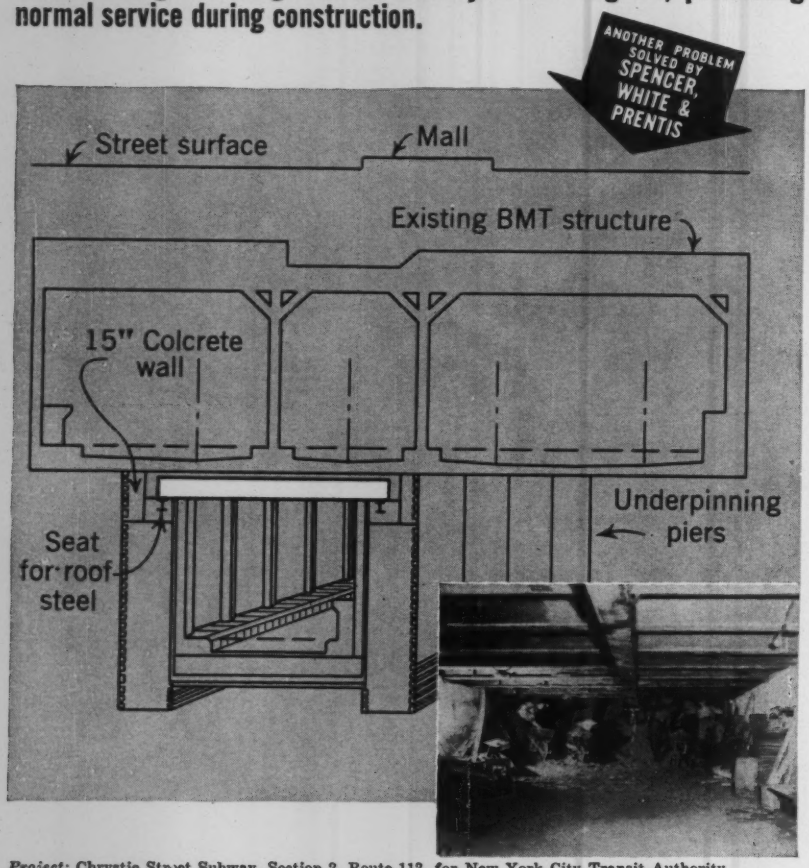
PERMANENT STEEL SUBWAY ROOF DOUBLES AS SHORING

Unusual underpinning supports operating subway while new track is built beneath. Plan entails no interior shoring of existing subway, no track-shifting or changes in electric system or signals, permitting normal service during construction.



Project: Chrystie Street Subway, Section 2, Route 112, for New York City Transit Authority
General Contractor: Cayuga Construction Corp., New York City

With headroom of 5 in. or less between the top of the new steel and the bottom of the operating subway, the use of temporary needle beams as a shoring method on this job posed a problem.

Solution: this unusual plan. The new line's permanent steel roof beams (increased in size and length) were incorporated into the underpinning system, carrying the load temporarily to the retaining walls and later to the completed new foundation.

Write for literature describing this procedure, the Colcrete wall construction, the use of Pretest cylinders to underpin the old subway columns, and other interesting features.

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(Continued from page 152)

SHOPPING CENTER; $90,000, paved shopping area and auto center; $60,000, area earthwork, Long Point and Witte Rd., area, HOUSTON, TEX. Grand total $1,940,000. CD 12/15/59.

Houck Realty Co., 2920 Weslayan St., Houston, Tex., Owner Builds, $431,125, 45 DWELLINGS; $410,000, 41 DWELLINGS, HOUSTON, TEX. CD 5/2.

Judge Constr., Inc., P.O. Box 22054, Houston, Tex., LB $402,750, Base Bid, (8 bidders), Milby SENIOR HIGH SCHOOL ADDN., HOUSTON, TEX. Houston Independent School Dist., 1300 Capitol Ave., Houston, Tex. Bids Apr. 19. CD 4/11.

▲ **H. J. Kaiser Co.**, 1924 Broadway, Oakland 12, Calif., CA Est. $3,000,000-$5,000,000, GYPSUM PLANT, HOUSTON, TEX. Kaiser Gypsum Co., 1924 Broadway, Oakland 12, Calif. CD 2/9.

Jas. E. McDaniels & Frank Thielen, Contractors, 9507 Braeburn Glen, Houston, Tex., Owner Builds, $437,150, 36 DWELLINGS; $444,450, 39 DWELLINGS, Sheldon Road and Hy. 90, HOUSTON, TEX. CD 3/9.

Mallette & Winter Bldg. Co., 3302 Norfolk St., Houston, Tex., CA $453,000, 25 brick DWELLINGS; $434,000, 28 DWELLINGS, second section, Songwood Subdivision, HOUSTON, TEX. Mallette & Belin Bldg. Co., Inc., 10106 Fleming St., Houston, Tex. CD 2/9.

Merit Homes, Inc., 4410 Richmond Ave., Houston, Tex., Owner Builds, $400,000, 30 DWELLINGS, HOUSTON, TEX. CD 4/28.

M. P. Moore, Contractor, 7050 Sharpcrest St., Houston, Tex., Owner Builds, $446,175, 24 DWELLINGS; $405,000, 16 DWELLINGS, Sharpstown Subdivision, HOUSTON, TEX. CD 3/7.

Nelson Puett & Assoc., Builders, 6427 Richmond Dr., Houston, Tex., Owner Builds, $432,925, 18 DWELLINGS, HOUSTON, TEX. CD 5/3.

▲ **Petro-Tex Chemical Corp.**, Laporte Rd., Houston, Tex., Owner Builds, $1,250,000, sulfuric-acid alkylation unit, near HOUSTON, TEX. CD 3/11/58.

▲ **Southern Investors Constr. Co.**, 705 Holmes Rd., Houston, Tex., Owner Builds, $525,000, 22 DWELLINGS; $460,000, 16 DWELLINGS; $420,000, 12 DWELLINGS, ½ mi. east of Walnut Bend Addition, HOUSTON, TEX. Grand total $1,405,000. CD 4/21.

Tilson Built Homes, 5518 Yale St., Houston, Tex., Owner Builds, $411,100, 37 DWELLINGS; $433,225, 41 DWELLINGS, HOUSTON, TEX. CD 5/3.

▲ **United Mercantile, Inc.**, 5570 Wesleyan St., Houston, Tex., Owner Builds, $2,700,000, retail STORE; $90,000, paved area and auto center; $60,000, site earthwork; $55,000, water sys., HOUSTON, TEX. Grand total, $2,905,000. CD 5/2.

▲ **Pat H. Stanford**, 2511 W. Industrial St., Midland, Tex., CA $2,150,000, SHOPPING CENTER; CA $99,195, asphalt-paved area and auto center; CA $57,118, site area earthwork, Dellwood Plaza, Illinds, Midkiff and Raymond Sts., MIDLAND, TEX. Malcolm McCurdy, Arden R. Grover and Gordon Knox, Midland Savings & Loan Bldg., 300 W. Wall St., Midland, Tex. Grand total $2,306,313. CD 5/11.

▲ **O. L. Olsen Co., Inc.**, 416 Pierce St., Houston, Tex., CA $1,250,000, NATURAL GAS PROCESSING PLANT, PALACIOS, TEX. Tennessee Oil Refining Co., 416 Pierce St., Houston, Tex.

Wm. Matera Contractor, 3662 Fredericksburg Rd., San Antonio, Tex., CA Approx. $500,000, Units 6, 7 and 8 SHOPPING CENTER, Fredericksburg and Vance Jackson Rds., SAN ANTONIO, TEX. Northwest Regional Shopping Center, 403 Blanco Rd., San Antonio, Tex. CD 5/5.

Robert Morehead of Preston Forest Shopping Center, and Lloyd Baxter, 4165 Meadowdale St., Dallas, Tex., Owner Builds, $800,000, APARTMENT Unit No. 3, named Desert Inn, SAN ANTONIO, TEX. CD 2/26.

F. L. Scott & Son, P.O. Box 5056, San Antonio, Tex., CA $909,430, HOME FOR AGED, Babcock and St. Cloud Rds., SAN ANTONIO, TEX. Methodist Church, Dist. Church Bd. for Homes for Older Adults, Austin National Bank of Commerce Bldg., San Antonio, Tex. CD 4/28, under LB.

▲ **M. W. Kellogg Co.**, Miller Rd., Houston, Tex., CA $53,000,000, 150,000 bbl. daily capacity, crude-running REFINERY UNIT and 47,600 bbl. daily capacity Catalytic Cracking unit, TEXAS CITY, TEX. American Oil Co., Texas City, Tex. CD 5/3.

▲ **W. B. Uhlhorn Constr. Co.**, P.O. Box 2028, Harlingen, Tex., LB $1,427,427, (8 bidders), Knapp HOSPITAL, WESLACO, TEX. Mid-Valley Hospital, Knapp Memorial, Weslaco, Tex. Bids Apr. 22. CD 3/29.

▲ **Mead & Mount Constr. Co.**, Denver Club Bldg., Denver, Colo., CA $1,070,234, est. $1,000,000, 136,000 sq. ft. INVENTORY WAREHOUSE, at Martin Plant Tital Missile Proj., DENVER, COLO. Martin Co., 12250 S. Hy. No. 75, Littleton, Colo. CD 2/29.

▲ **F. R. Orr Constr. Co., Inc.**, 4414 Vine St., Denver, Colo., CA $1,441,606, est. $2,000,000, 3 story, 120,000 sq. ft. Martins INDUSTRIAL ADMIN. addn. (Titan Missile Plant), DENVER, COLO. Martin Co., 12250 S. Hy. No. 75, Littleton, Colo. Bids Apr. 28, awarded May 4. CD 5/3, under LB.

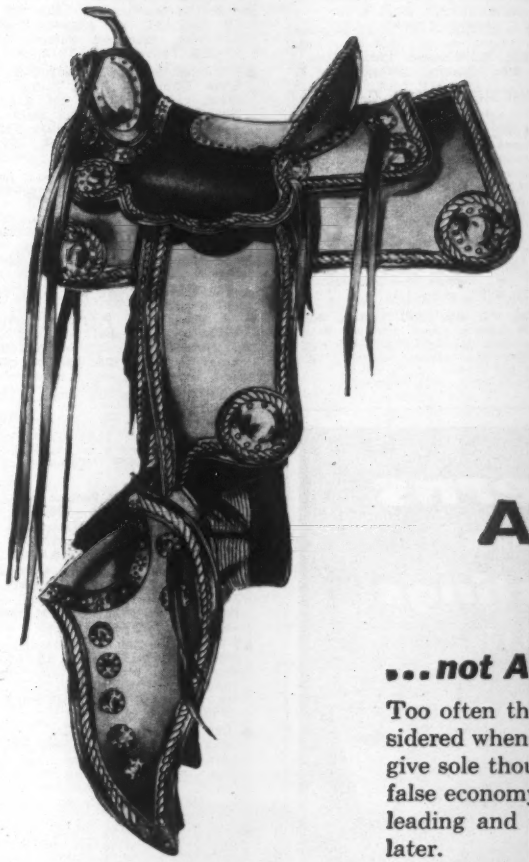
FAR WEST

HEAVY CONSTRUCTION—BA

▲† **California**—BA About 6/7—U. S. Eng., 180 New Montgomery St., San Francisco, repairs to jetties, Humboldt Bay, Humboldt County, CIVENG-04-203-60-23, Approx. $2,000,000.

▲† **California**—BA 6/8—Bureau Reclamation, Dpt. Interior, Lewiston, 2-unit Clear Creek Powerplant anc

(Continued on page 158)



"SADDLES ARE FOR HORSES"

...not American Cast Iron Pipe!

Too often the first cost of the material is the only factor considered when deciding between cast iron pipe or a substitute. To give sole thought to the cheaper substitute piping is, in a sense, false economy because many times this lower initial cost is misleading and obscures added expenses which must be incurred later.

Yes, the first cost may be cheaper... but cast iron pipe offers so much more.

Consider tapping. For reliable, economical water service, the tapped main must meet four definite requirements: (1) Have strength to withstand tapping operation; (2) Be of an *easily* tapped material which will assure *uniform* threads; (3) Have strength after being tapped to withstand service conditions; (4) Have threads that will provide tight connections after exposure to service stresses. *Cast iron pipe meets all of these tapping requirements.*

When tapping substitute piping, it is often necessary . . . to employ skilled workmen with special equipment . . . to utilize tapping saddles . . . to use extreme care in order to make a connection that does not leak.

Remember . . . tapping saddles are an extra expense and are *not necessary to make service connections to cast iron pipe.*

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(Continued from page 156)

Trinity powerplant, Central Valley Proj. Spec. DC 5320. Extended date. CD 4/26.

▲† **Hawaii**—NIKE-HERCULES—BA About 6/9—U.S. Eng., Bldg. 96, Fort Armstrong, Honolulu, Zone 13, nike-hercules constr. project, Site 1, Oahu, ENG-94-612-60-9, $1,500,000. CD 2/16.

BUILDINGS—BA

▲† **Idaho, Mountain Home** — CAPEHART HOUSING — BA 5/26—Base Procurement Office, Mountain Home Air Force Base, 820-units Capehart Housing, Mountain Home Air Force Base (No. 2), $10,000,000. Hummel, Hummel & Jones, 1324 Idaho St., Boise, Idaho, and Neutra & Alexander, 2379 Glendale Blvd., Los Angeles, Calif., archts. CD 4/25.

▲† **Calif., Lemoore**—HOSPITAL, etc.—BA 6/1—Dist. P. Wks. Office, 12th Naval Dist., San Bruno, 51,500 sq. ft. station hospital and dental clinic, Lemoore Naval Air Station, $1,000,000. CD 9/25.

▲† **Calif., Lemoore**—HOUSING—BA 6/1—Dist. P. Wks. Office, 12th Naval Dist., San Bruno, 500-units Capehart Housing, 2nd Increment, NBy 29277, $8,000,000. Extended date. Richard J. Neutra, Robert Alexander & Donald Francis Haines, 341 Market St., San Francisco, archts. CD 5/9.

Calif., Sacramento—HEADQUARTERS EQUIPMENT DEPARTMENT ADDN., etc.—BA 6/2—State Div. Architecture, 1120 N St., Sacramento, 39,400 sq. ft. alterations, addns. to State Div. Hys. Headquarters Equipment Dpt., at 34th and R Sts., W.O.4285SC. $825,000. Plans deposit $50. CD 12/5/58.

Wash., **Liberty Lake** — SCHOOL — BA 6/23 — Liberty School Dist. 362, 39,000 sq. ft., rein.-con., frame high school, $650,000. Plans deposit $50. McClure & Adkison, Sherwood Bldg., Spokane, archts. CD 2/17.

HEAVY CONSTRUCTION—LB & CA

▲† **Adak P.O.L. Contractors**, Box 1039, Anchorage, Alaska, LB $1,987,000, est. $2,708,831 (2 bidders), 42x116 ft. steel frame building, 34x52 ft., rein.-con. building, 17x20 ft. steel frame building, grading, roads, steel antennas, utilities, etc., communication facilities, Spec. 28318/60, ADAK, ALASKA. P. Wks. Officer, 13th Naval Dist., Naval Station, Seattle, Wash. Bids May 5. CD 4/21.

▲ **ARIZONA**—State Hy. Dpt., 206 S. 17 Ave., Phoenix,
Western Constructors, Inc., P.O. Box 1604, Phoenix, Ariz., CA $2,248,743, imprv. Benson-Steins Pass and Bowie Jct.-Safford Hy., Cochise Co. Bids Apr. 22, awarded May 2. CD 4/27, under LB.

▲ **General Constr. Co.**, P.O. Box 3845, Seattle, Wash., LB $1,077,118, (4 bidders), fixed pier and floating piers at Shilshole Bay Marina, SEATTLE, WASH. Port of Seattle, Bell St. Terminal, Seattle, Wash. Bids May 3. CD 4/20.

† **CALIFORNIA**—Bureau P. Rds., 133 Hermann St., San Francisco, Bids opened 5/3,
Jess H. Harrison Co., P. O. Box 315, San Ardo, Calif., LB $552,633, (10 bidders), road constr. at Big Oak Flat, Stanislaus National Forest, Proj. IFB R7-316, Tuolumne Co. CD 4/18.

▲† **Winston Bros. Co., Johnson-Drake & Piper, Inc.** and **Green Constr. Co.**, 301 Clifton Ave., Minneapolis, Minn., LB $11,617,104, est. $14,018,379, (11 bidders), Central Valley Proj. Spring Creek power conduit, Tunnels No. 1 and 2, Rock Creek Siphon, Redding, Shasta Co., Spec. DC 5294, CALIFORNIA. Bureau Reclamation, Dpt. Interior, Lewiston, Calif. Bids May 5. CD 3/16.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,
Griffith Co., 1060 S. Broadway, Los Angeles, Calif., LB $6,898,595 (6 bidders), 8-lane elevated freeway 1.2 mi. Santa Monica Freeway, between Main St. and Hooper Ave., Los Angeles, Los Angeles Co. Bids May 5. CD 3/23.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,
B. J. Ukropina, T. P. Polich, Steve Kral & John R. Ukropina, P. O. Box 105, San Gabriel, Calif., CA $1,148,448, wid'n 6.5 mi. San Bernardino Freeway, Los Angeles Co. Bids Apr. 28, awarded May 4. CD 5/4, under LB.

CALIFORNIA—State Div. Hys., 1120 N St., Sacramento,
rejected bids Apr. 13, reconstr., realignment 5.4 mi. FAS County Rd. 1183 (Onion Valley Rd.) between Onion Valley and 8 mi. west of Independence, Inyo Co., CA $546,537. (Correction—status). CD 4/27, under CA.

Steve P. Rados, Inc. & Pentaco Inc., 112 W. Maple Ave., Monrovia, Calif., CA $986,928, est. $1,068,652, Fletcher Dr. grade separation and S.P. railway, LOS ANGELES, CALIF. City, 153 City Hall, Los Angeles, Calif. Bids Apr. 20, awarded May 5. CD 4/8, under LB.

▲ **N. P. Van Valkenburg Co.**, 1627 Chico St., El Monte, Calif., LB $1,064,578, (8 bidders), constr. 4th Street Trunkline Unit 1, LOS ANGELES, CALIF. Los Angeles Water & Power Dpt., 316 W. 2nd St., Los Angeles, Calif. Bids May 5. CD 4/14.

▲† **Fred A. Arnold Co.**, 3105 Hollycrest, Los Angeles, Calif., CA $1,833,939, est. $1,961,000, constr. various bldgs. Naval Missile Facility, Point Arguello, IFB 25930/59, POINT MUGU, CALIF. Dist. P. Wks. Office, 11th Naval Dist., San Diego, Calif. Bids Apr. 27. CD 5/2, under LB.

▲ **Guy H. James Constr. Co.**, P. O. Box 9575, Oklahoma City, Okla., CA $3,607,200, 13 ft. diam. unlined, 17,000 ft. Robbs Peak Tunnel unit, Upper American River Proj., Inv. No. 2214, SACRAMENTO, CALIF. Sacramento Municipal Utility Dist., 1708 59 St., Sacramento, Calif. Bids May 3, awarded May 5. CD 5/5, under LB.

▲ **Ira H. Larsen Co.**, 64 S. Park St., San Francisco, Calif., LB $1,233,111, Base bid, rebuilding concrete exhibit tanks, constr. large exhibition tanks garage addn., Steinhart Aquarium, Golden State Park, SAN FRANCISCO, CALIF. City and San Francisco Co., Dpt. P. Wks., City Hall, San Francisco, Calif. Bids May 4. CD 4/12.

J. S. Barrett, Inc., 15722 E. St. Gertrude Pl., Santa Ana, Calif., LB $653,466, (5 bidders), Contr. 3-9, Magnolia Relief Sewer, SANTA ANA, CALIF. Orange County Sanitary Dist. No. 3, 1104 W. 8 St., Santa Ana, Calif. Bids Apr. 27. CD 4/13.

Wal-Con Constr. Co., 13837 Ventura Blvd., Sherman Oaks, Calif., LB $771,677, (8 bidders), Contr. 2-7 Atwood Sub Trunk Sewer, SANTA ANA, CALIF. Orange County Sanitation Dist. 2, 1104 W. 8 St., Santa Ana, Calif. Bids Apr. 27. CD 8/15/58.

BUILDINGS—LB & CA

▲ **Kitchell-Phillips Contg. Co.**, 1006 South 24 St., Phoenix, Ariz., CA $1,400,000, CLUBHOUSE, PHOENIX, ARIZ. Phoenix Country Club, Thomas Rd. and 7 St., Phoenix, Ariz. Bids Apr. 26, awarded May 3. CD 4/28.

▲ **M. J. Kuney Co.**, N. 120 Ralph St., Spokane, Wash., CA Est. $2,000,000, 2 story, bsmnt., 223,000 sq. ft. rein.-con. masonry DEPARTMENT STORE, SPOKANE, WASH. Sears, Roebuck & Co., 925 S. Homan St., Chicago, Ill. Bids Feb. 18. CD 2/26, under LB.

▲ **Sceva Constr. Co.**, N. 2928 Modelia St., Spokane, Wash., LB $1,010,948, (10 bidders), general contract 112,421 sq. ft., masonry, rein.-con. Northwest JUNIOR HIGH SCHOOL, SPOKANE, WASH. School Dist. 81, W. 825 Trent Ave., Spokane, Wash. Bids May 4. CD 4/21.

▲ **A. V. Petersen Co.**, 2827 N.E. Glisan St., Portland, Ore., CA Est. $1,000,000, WAREHOUSE addn., PORTLAND, ORE. Western Electric Co., 1235 N.E. 47th Ave., Portland, Ore. Bids Apr. 14. CD 4/11.

Arntz Constr. Co., 1745 Filbert St., San Francisco, Calif., LB $834,768, (7 bidders), HILGARD HALL rehabilitation, BERKELEY, CALIF. Regents of University of California, Office of Arch. & Engrs., 2 Barrow Lanes, Berkeley, Calif. Ratcliff & Ratcliff, 2286 Fulton St., Berkeley, Calif., archts. Haluk Akol, 2171 Shattuck Ave., Berkeley, Calif., engr. Bids May 3.

▲ **Nielsen Constr. Co.**, 3127 Jefferson, San Diego, Calif., and **Lindgren & Swinerton**, 1631 Beverly Blvd., Los Angeles, Calif., LB $1,367,416, (6 bidders), White Sands of La Jolla RETIRED HOME addn., LA JOLLA, CALIF. Southern California Presbyterian Homes, 1501 Wilshire Blvd., Los Angeles, Calif. Bids May 2. CD 4/18.

M. E. Didier, 5964 West Blvd., Los Angeles, Calif., LB $817,455, (12 bidders), PHYSICAL EDUCATION and GIRLS LOCKER ROOM, Hamilton High School

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and BOYS SHOWER and LOCKER ROOM, University High School, LOS ANGELES, CALIF. Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. Austin, Field & Fry, 2311 W. 3 St., Los Angeles, Calif., archts. CD 6/9/58.

Baldwin Contg. Co., P. O. Box 311, Marysville, Calif., LB **$871,700**, (8 bidders), SOLID ROCKET PLANT addns., Modifications, Spec. 5858, NIMBUS STATION, CALIF. AETRON, Div. Aerojet-General Corp., P. O. Box 1947, Sacramento, Calif. Bids May 4. CD 2/10/56.

Altfillisch Constr. Co., 2787 La Miranda Ave., La Habra, Calif., CA grading site for RESEARCH CENTER, PALOS VERDES, CALIF. Northrop Corp., 9744 Wilshire Blvd., Los Angeles, Calif. Charles Luckman Assocs., 9220 Sunset Blvd., Los Angeles, Calif., archts. CD 7/13.

Samuelson Bros., 3441 Ocean View Blvd., Glendale, Calif., CA **$720,242**, La Canada JUNIOR HIGH SCHOOL addns., alterations, La Canada, PASADENA, CALIF. Bd. Educ., 351 S. Hudson Ave., Pasadena, Calif. Bids Apr. 12. CD 4/25, under LB.

▲ **J. A. Campbell, Inc.**, 6510 Cherry Ave., Long Beach, Calif., LB **$1,860,100**, (8 bidders), second increment, Pasadena HIGH SCHOOL, PASADENA, CALIF. Bd. Educ., 351 South Hudson Ave., Pasadena, Calif. Bids May 3. CD 4/11.

▲ **H. W. Stanfield**, 3491 Kurtz St., San Diego, Calif., CA **$1,082,650**, DEPARTMENT EDUCATION BLDGS., Linda Vista, SAN DIEGO, CALIF. County of San Diego, Civic Center, San Diego, Calif. Bids Apr. 19, awarded May 4. CD 4/25, under LB.

Stolte, Inc., 8451 San Leandro St., Oakland, Calif., CA **$600,000**, 60 unit MOTOR HOTEL between Columbus Ave., Jones, Bay and North Point Sts., SAN FRANCISCO, CALIF. William Loorz & Jim Hamm, c/o Anshen & Allen, archts., 461 Bush St., San Francisco, Calif.

Bel-View Builders, Inc., 1336 Bayshore Hy., San Jose, Calif., Owner Builds, **$625,000**, rein.-con. OFFICE and LABORATORY, near Monterey and Edenvale Rds., SAN JOSE, CALIF. I. B. M. Corp., lessee. Johnson Hawley & Assoc., Stanford Professional Center, 800 Welsh Rd., Palo Alto, Calif., archts.

Carl N. Swenson Co., 1095 Stockton Ave., San Jose, Calif., LB **$516,944**, Base Bid, 1 story, 32,000 sq. ft. rein.-con. ADMINISTRATION BLDG., SAN JOSE, CALIF. San Jose City Unif. School Dist., 408 Almaden Ave., San Jose, Calif. Bids May 3. CD 4/13.

▲ **Edward Smith, Inc.**, 1968 Alvarado St., San Leandro, Calif., CA **$2,500,000**, 182,000 sq. ft. SHOPPING CENTER to incl. Department Store, Bank, 40-Lane Bowling Alley, Drug Store, Small Stores, El Camino Real and Kiely Blvd., SANTA CLARA, CALIF. United California Theaters, Inc., 172 Golden Gate Ave., San Francisco, Calif. Skidmore & McWilliams, 901 Third St., San Francisco, Calif., archts. CD 2/17.

▲ **Gordon H. Ball, Inc.**, 2725 Concord Ave., Concord, Calif., LB **$1,456,500**, (7 bidders), Base Bid, 4 story, 55,000 sq. ft., rein.-con., concrete roof deck and floors COUNTY JAIL, VISALIA, CALIF. Tulare Co., County Courthouse, Visalia, Calif. Bids Apr. 19. CD 3/17.

Campbell Constr. Co., 800 R St., Sacramento, Calif., LB **$965,645**, (9 bidders), tilt-up concrete structure, steel and wood frame PHYSICAL EDUCATION BLDG. and addn. Woodland HIGH SCHOOL, WOODLAND, CALIF. Woodland Joint Union High School Dist., College and Bartlett Sts., Woodland, Calif. Bids May 3. CD 4/12.

▲† **Hawaiian Dredging & Constr. Co. Ltd.**, 1350 Ala Maana, Honolulu, Hawaii, CA **$14,318,941**, 864-units Capehart HOUSING, site preparation, supporting facilities, Fort Shafter and Schofield Barracks, ENG-94-612-60-11B, HONOLULU, HAWAII. U. S. Eng., Bldg. 96, Fort Armstrong, Honolulu, Hawaii. CD 4/21 and 3/4, under LB.

CANADA

BUILDINGS—BA

▲ **Man. Middlechurch**—INSTITUTE—BA 5/26—Benedictine Mother House, c/o Arthur V. Mauro, 209 Bank of Nova Scotia Bldg., Winnipeg, 3 story, frame, masonry Catholic Institute, $1,000,000. Gardiner, Thornton, Gathe & Assocs., 1521 Alberta St., Vancouver, B. C., archts. and Wasiman & Ross, 208 Edmonton St., Winnipeg, assoc. archts. CD 2/17, under Man., West St. Paul.

N. B., Moncton—HOSPITAL—BA 6/7—Moncton City Hospital Bd., 6 story, rein.-con., concrete, brick hospital addn. $600,000. Plans deposit $50. Govan, Ferguson, Lindsay, Kaminker, Langley & Keenleyside, 10 Price St., Toronto, Ont., archts. CD 10/19.

▲ **Ont., London**—POSTAL TERMINAL—BA 6/22—Dpt. P. Wks., Hunter Bldg., Ottawa, postal terminal, Clarence and York Sts. $1,000,000. Plans deposit $500. Blackwell & Hagarty, 310 Princess Ave., archts. CD 3/8.

BUILDINGS—SLC

Que., Montreal—FACTORY—Truscon Steel Co. Ltd., 6001 Irwin St., soon lets contract 1 story, 280x448 ft., brick, steel factory addn., concrete fdn. $750,000. Percy Booth, 4795 St. Catherine St. W., archt. T. Pringle & Son Ltd., 4795 St. Catherine St. W., consult. archts. CD 2/7/56.

HEAVY CONSTRUCTION—LB & CA

▲ **Banister Constr. Co. Ltd.**, Edmonton, Alta., CA Est. **$6,500,000**, 72 mi. 24 in. trunk gas main lines, Torrington to Rimbey, ALBERTA. Alberta Gas Trunk Line Co. Ltd., 320 96th Ave. S.W., Calgary, Alta. CD 4/13.

K. H. Beamish Constr. Co. Ltd., Box 189, Thornhill, Ont., CA **$717,023**, b. conc. paving, macadam base course, macadam shoulders, Don Valley Parkway, Royal Dr. to Leaside viaduct, TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. E., Toronto, Ont. Bids Apr. 7, awarded May 2. CD 4/13.

E. J. Parsons, Sweetsburg, Que., LB **$461,983** (17 bidders) 150x6,000 ft. runway, 200x300 ft. parking area, connecting taxiway at proposed airport site, THREE RIVERS, QUE. Dpt. Transport, Hunter Bldg., Ottawa, Ont. Beauchemin, Beaton, Lapointe, 6555 Cote des Neiges Rd., Montreal, engr. Bids May 3. CD 4/8.

▲ **Tellier & Groleau Inc.**, 2391 Place de Vaudreuil, Trois Rivieres, CA **$1,226,927**, 2 m.g.d. filtration plant, water intake, TROIS RIVIERES, QUE. City of Trois Rivieres, City Hall, Trois Rivieres,, Que. Bids Apr. 25, awarded Apr. 29. CD 5/2, under LB.

BUILDINGS—LB & CA

Arlington Builders Ltd., 875 Madison St., Winnipeg, Man., CA Est. **$400,000** (10 bidders), SCHOOL, KIRKFIELD PARK, MAN. Kirkfield Park School Div. No. 30, Kirkfield Park, Man. Bids Mar. 18. CD 2/25.

Specialized Building Services Ltd., St. Boniface, Man. CA Est. **$500,000**, MOTEL-HOTEL south side Trans-Canada Hy., east of St. Annes Rd., ST. VITAL, MAN. Owner, c/o Tupper, Adams & Adams agents, Crown Trust Bldg., Winnipeg, Man. L. Finch, 116 Phoenix Bldg., Winnipeg, Man., archt. Awarded Apr. 28. CD 9/23/58.

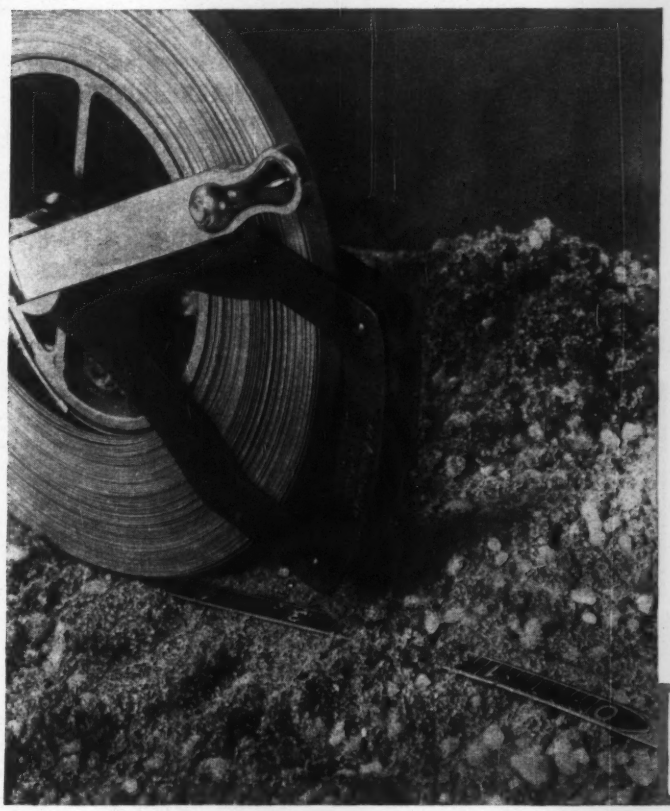
Barnett-McQueen Co. Ltd., 460 Christina St. E., Fort William, Ont., CA Est. **$500,000**, substructure and revetment work for ELEVATOR, PORT ARTHUR, ONT. United Grain Growers Ltd., Hamilton Bldg., 395 Main St., Winnipeg, Man. C. D. Howe Co. Ltd., 710 Public Utilities Bldg., Port Arthur, Ont., engr. CD 10/6.

▲ **Faseel Constr. Co. Ltd.**, 2201 Kingston Rd., Toronto, Ont., CA Est. **$3,500,000**, HOSPITAL extensions, addns., PORT ARTHUR, ONT. Sisters of St. Joseph, c/o St. Joseph General Hospital, Port Arthur, Ont. Fabbro & Townsend, 251 Lorne St. S., Sudbury, Ont., archts. C. D. Howe Co. Ltd., Public Utilities Bldg., Port Arthur, Ont., engrs.

Belmont Constr. Co. Ltd., 246 Vaughan Rd., Toronto, Ont. Owner Builds, **$700,000**, APARTMENT, 172 Jameson Ave., TORONTO, ONT. George Jarosz, 1949 Eglinton Ave. W., Toronto, Ont., archt. CD 2/4.

Percival Hebert, 163 St. Laurent Blvd., Maple Grove, Que., LB **$483,094** (8 bidders), 2 story, brick SCHOOL and RECREATION HALL, concrete fdn., BEAUHARNOIS, QUE. School Bd. of Beauharnois, Beauharnois, Que. CD 1/25.

▲ **Magil Constr. Ltd.**, 410 Gratton St., St. Laurent, Montreal, Que., CA **$1,896,500**, HIGH SCHOOL, Westmount Athletic Grounds, St. Catherine St. W., MONTREAL, QUE. Westmount Protestant School Comn., 10



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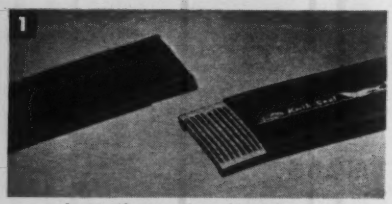

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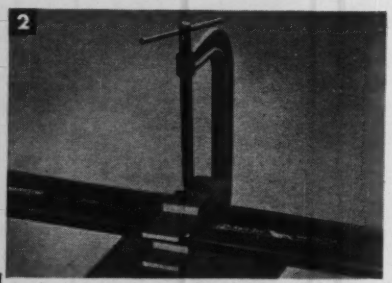

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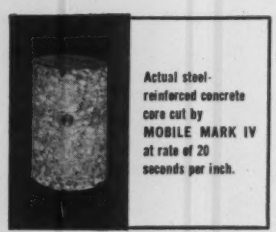

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Academy Rd., Westmount, Montreal, Que. Bids Apr. 6, awarded Apr. 27. CD 4/13, under LB.

LATIN AMERICA

HEAVY CONSTRUCTION—BA

▲ **Colombia**—BA 6/30—Empresa de Energia Electrica de Bogota, Bogota, Colombia, water storage, rock and compacted sand dam, 29 meters high and 235 meters long; dike, spillway (open cut), tunnel, water channel, cut-off for dam and unpaved road, Guatavita.

U. S. POSSESSIONS

BUILDINGS—LB & CA

▲† **Jones-Mahoney Corp.**, 1715 Lemon St., Tampa, Fla., U.S.A., LB $3,078,000, 264-units Richmond Estates HOUSING development, Christiansted, ST. CROIX, VIRGIN ISLANDS. Virgin Islands Housing & Urban Renewal Auth., Charlotte Amalie St., Thomas, V. I. CD 5/7/56.

FOREIGN

HEAVY CONSTRUCTION—BA

▲ **Greece**—BA 5/26—Special Pinos Dam Committee, Hydroelectric Works Service, Ministry of Public Works & Communications, 7 Themistocleous St., Athens, dam about 2,000 meters long with 50 meters high approx. southwest of Patras, Pinios River. Over $10,000,000. Plans deposit $18.70.

BUILDINGS—LB & CA

▲ **Holland, Hannen & Cubitts (Northwest) Ltd.**, 1 Queen Anne's Gate, London, S. W. 1, England, CA Est. $9,100,000 PLANT to manufacture washing machines, refrigerators and vending machines, KIRKBY, ENGLAND. Fisher-Ludlow Ltd., Sub British Motors Corp., 41 Piccadilly, London, W. 1, England. L. C. Wakeman & Partners, 2 Lowndes St., London, S. W. 1, England, engrs. Harry W. Weedon & Partners, archts, c/o engineers.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Calif., Anaheim**—City, City Hall, voted $3,800,000 bonds for WW. CD 11/3/54.

Idaho, Nampa—City, City Hall, 6 m.g. reservoir, with connecting line and pumphouse. $775,000. S. Johnson, Nampa, consult. engr. CD 6/30/50.

▲ **Ill., North Chicago**—City, City Hall, voted bonds Apr. 26, WW and sewers. $2,601,000. CD 3/1.

▲ **N. Y., Buffalo**—City, City Hall, cooling water project, incl. pumping plant and mains sys. to transport Lake Erie water to industrial plants. $7,000,000. McFarland & Johnson, Sidway Bldg., Buffalo 2, N. Y., engrs.

▲ **N. C., Wilmington**—City, City Hall, water imprvs. $1,000,000.

SEWERS, WASTE DISPOSAL

▲ **Alaska, Fairbanks**—City, City Hall, treatment plant and reservoir, $2,380,000, Bids to be called next year, CD 1/4/52; sanitary sewers, $1,148,550, Bids to be called this year, CD 7/27.

▲ **Calif., Anaheim**—City, City Hall, voted $1,300,000 bonds for storm sewers.

▲ **Fla., St. Petersburg**—City, City Hall, sanitary sewerage sys. Bear Creek System, $246,000; sanitary sewerage sys., Boca Ciaga System, $121,000; sanitary sewerage sys. Placido Bayou system, $212,000; sanitary sewerage sys., Riviera Bay Area, $361,000; sanitary sewerage sys., Toytown system, $925,000.

Ill., Dixon—City, City Hall, defeated $790,000 bonds Apr. 26, sewerage sys. extens., imprvs. incl. treatment facilities, storm and sanitary sewers. Over $790,000. CD 4/21.

▲ **Mass., Chicopee**—City, City Hall, sewage treatment plant, Chicopee River Interceptor, Connecticut River Interceptor, Paderewski Pumping Station, Chicopee Center Interceptor, outfall and by-pass at plant. $2,986,000. To go ahead 1961.

▲ **Minn., Newport**—Village, Village Hall, sewage disposal plant. $1,250,000. Banister Engineering Co., 310 North Snelling Ave., St. Paul, consult. engr. to make survey.

BRIDGES

▲ **N. J., Paterson**—Bd. Freeholders Passiac Co., Court House, Lincoln Bridge between Paterson, West Paterson and Totowa. $1,000,000. Barnett & Herenchak, 30 Clinton St., Newark, consult. engrs. Geo. Mason, Court House, engr. CD 6/19.

▲ **OREGON**—State Hy. Dpt., Salem,

Douglas Co.—FAI U.S. 99 Rice Hill-Oakland Section. $3,200,000.

Lane Co.—FAI U.S. 99, Goshen-Cottage Grove Section. $1,260,000.

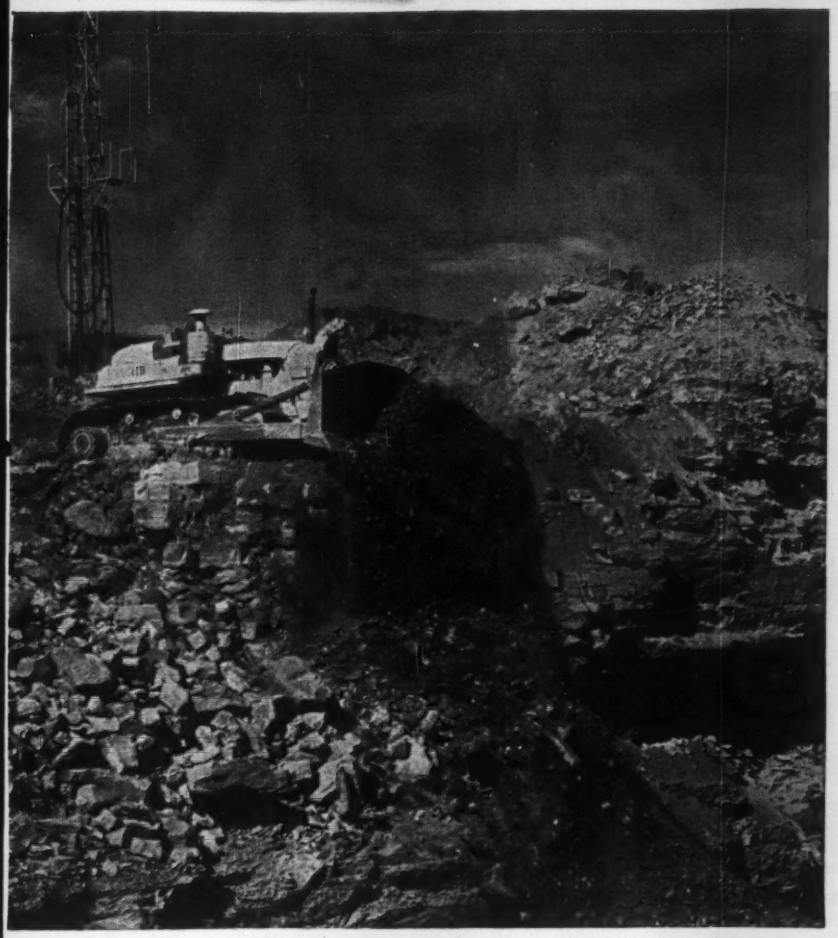
Sherman and The Dalles Counties—FAI U.S. 30, Celilo-Biggs Section. $4,400,000.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg,

Allegheny Co.—Glenwood bridge over Monogahela River between City of Pittsburgh and Baldwin Borough, $18,000,000.

south approach interchange to Glenwood Bridge, Baldwin and West Homestead Boros, $8,000,000. Richardson, Gordon Associates, 3 Gateway Center, Pittsburgh, consult. engrs.

(Continued on page 162)



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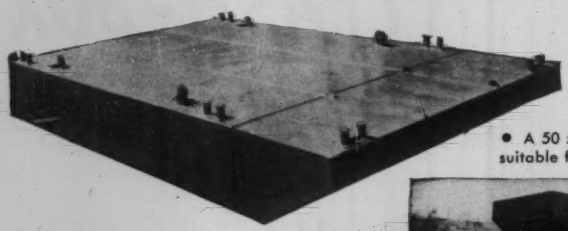

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(Continued from page 160)

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg,
Beaver Co.—three-span continuous steel truss bridge over Beaver River between Beaver Falls and Eastvale; approach roads, **$2,700,000.** Approved by Hy. and Bridge Authority for financing.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg,
Comberland Co.—2.6 mi., 4 lane rein.-con. hy. between Camp Hill boro at 32nd St. and Rte. 11 at Sporting Hill, 4 bridges, a sect. of West Shore By-pass, **$1,800,000.** Approved for Hy. and Bridge Authority financing.

STREETS AND ROADS

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg,
Blair Co.—reconstr. about three mi. Rte. 220 in vicinity of Hollidaysburg, **$1,200,000.**
reconstr. Rte. 22 between Canoe Creek and Yellow Springs, **$1,000,000.**
Potter Co.—reconstr. Rte. 6, between Sweden Valley and West Pike, **$1,500,000.**

EARTHWORK, WATERWAYS

▲ **California**—State Dpt. Water Resources, 1120 N St., Sacramento, Western Pacific R.R. relocation in connection with clearing way for constr. of Oroville Dam, unit of Feather River Proj. Butte Co., **$11,677,400;** Livermore Valley Canal and Del Valley Reservoir, South Bay Aqueduct units of Feather River Project and California Water Plan, Alameda Co., **$7,679,800;** county road bridge over Middle Fork of Feather River in clearing way for constr. of Oroville Dam unit of Feather River Proj., Butte Co., **$4,054,000;** subsidence feeder canal for San Joaquin Valley-Southern California Aqueduct, Feather River Project, San Joaquin, Merced Co., **$3,804,000;** Tunnel No. 1 in relocation of transportation facilities to clear way for constr. of Oroville Dam unit of Feather River Project, Butte Co., **$3,127,000;** relocating Feather Falls R.R. in clearing way for constr. of Oroville Dam unit of Feather River Proj., Butte Co., **$1,500,000;** clearing Oroville Dam and spillway site, Feather River Project, Butte Co., **$120,000.** CD 3/27/57.

AIRPORTS

▲ **Tex., Houston**—MAINTENANCE SHOPS, etc.—Delta Airlines, M. & M. Bldg., and Braniff International Airways, American Investment Bldg., maintenance shops and large open paved parking area for aircraft, **$1,000,000.**

▲† **Va., Saltville**—ROCKET & MISSILE FUEL PLANT—Dpt. Air Force, Pentagon, Wash., D. C., rocket and missile fuel plant. Approx. **$15,000,000** appropriated. Olin Mathieson Corp., 460 Park Ave., New York 22, N. Y., will operate.

PUBLIC BUILDINGS

▲ **Ala., Mobile**—HOUSING—Mobile Housing Bd., City Hall, plans by T. Cooper Van Antwerp., 354 St. Francis St., 500-unit low-rent housing, Happy Hill section, **$5,000,000.** CD 4/1/59.

▲ **Ark., Jonesboro** — STUDENT HOUSING — Arkansas State College, State College, plans by Elmer Stuck & Assocs., 217 E. Washington St., student housing. **$1,200,000.**

▲ **Calif., Anaheim** — SCHOOLS — Anaheim School Dist., 811 W. Center St., plans by Smith, Powell & Morgridge, 208 W. 8th St., Los Angeles, 70,000 sq. ft. frame, stucco La Palma Junior High School, **$1,250,000;** 130,000 sq. ft. frame, stucco Loara High School, **$2,350,000;** 67,000 sq. ft. frame, stucco Ball Junior High School, **$1,193,000.** CD 4/6/59.

▲ **Calif., Arcata**—LIBRARY, etc.—State Div. Architecture, 1120 N St., Sacramento, library **$1,035,100;** underground power distr. and lighting sys., Humboldt State College. **$137,250.**

▲ **Calif., Berkeley**—RADIATION LABORATORY—Regents of University of California, 2 Barrow Lane, plans by Spencer & Lee, 251 Kearny St., San Francisco, 6 story, bsmnt., rein.-con. frame radiation laboratory at University of California. **$1,600,000.** Pregnoff & Matheu, 251 Kearny St., San Francisco, consult. engrs.

▲ **Calif., Chico**—EDUCATION-PSYCHOLOGY—State Div. Architecture, 1120 N St., Sacramento, education-psychology bldg., Chico State College. **$1,052,000.**

▲ **Calif., Fresno**—INDUSTRIAL ARTS, etc.—State Div. Architecture, 1120 N St., Sacramento, industrial arts bldg. addn. **$696,200;** men's gymnasium addn. **$724,000,** Fresno State College.

▲ **Calif., Half Moon Bay**—SCHOOL—Half Moon Bay Union High School Dist., Kelley Dr., plans by Delp W. Johnson, Poole & Storm, 166 Geary St., San Francisco, 35,000 sq. ft. prestressed precast concrete slab on grade high school. **$1,000,000.**

▲ **Calif., Long Beach**—CLASSROOM BLDG., etc.—State Div. Architecture, 1120 N St., Sacramento, Classroom Bldg. No. 5 **$1,014,000;** surf. parking facilities, to provide 1,800 addnl. parking space, **$405,500;** addnl sewer and water facilities **$88,000,** Long Beach State College.

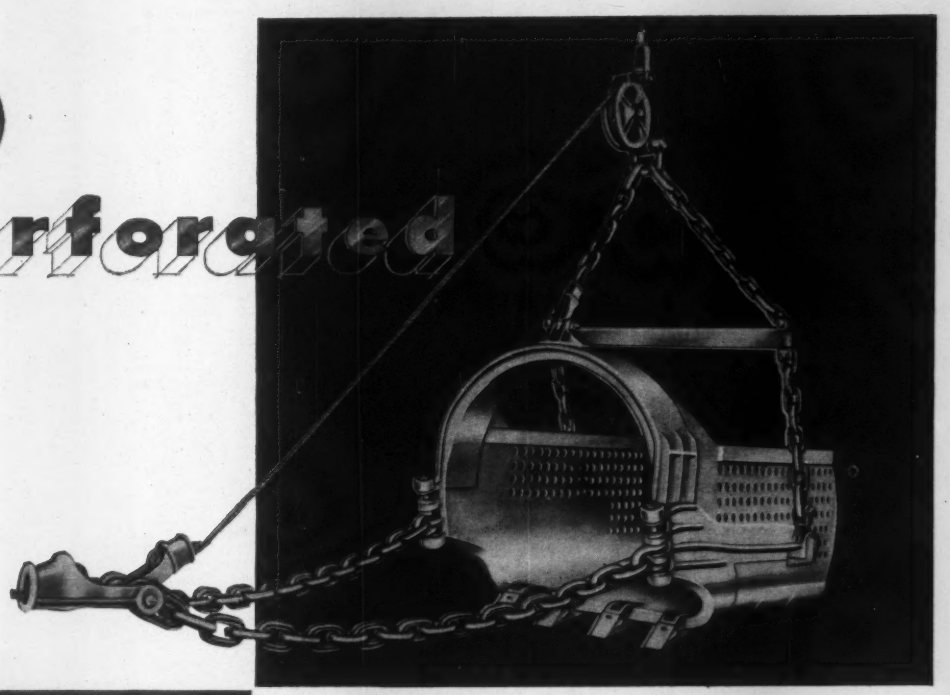
▲ **Calif., Los Angeles**—STATE BLDG. IMPRVS.—State Div. Architecture, 1120 N St., Sacramento, altering Los Angeles State Bldg., State Department of Finance. **$1,008,000.**

▲ **Calif., Porterville**—ACUTE HOSPITAL ANNEX—State Div. Architecture, 1120 N St., Sacramento, acute hospital annex, Porterville State Hospital, Dpt. Mental Hygiene. **$1,124,300.**

▲ **Calif., Roseville**—SCHOOL—Roseville City Elementary School Dist., P.O. Box 791, voted **$700,000** bonds Apr. 26 and **$1,200,000** State Aid, school. CD 3/1.

(Continued on page 164)

Perforated



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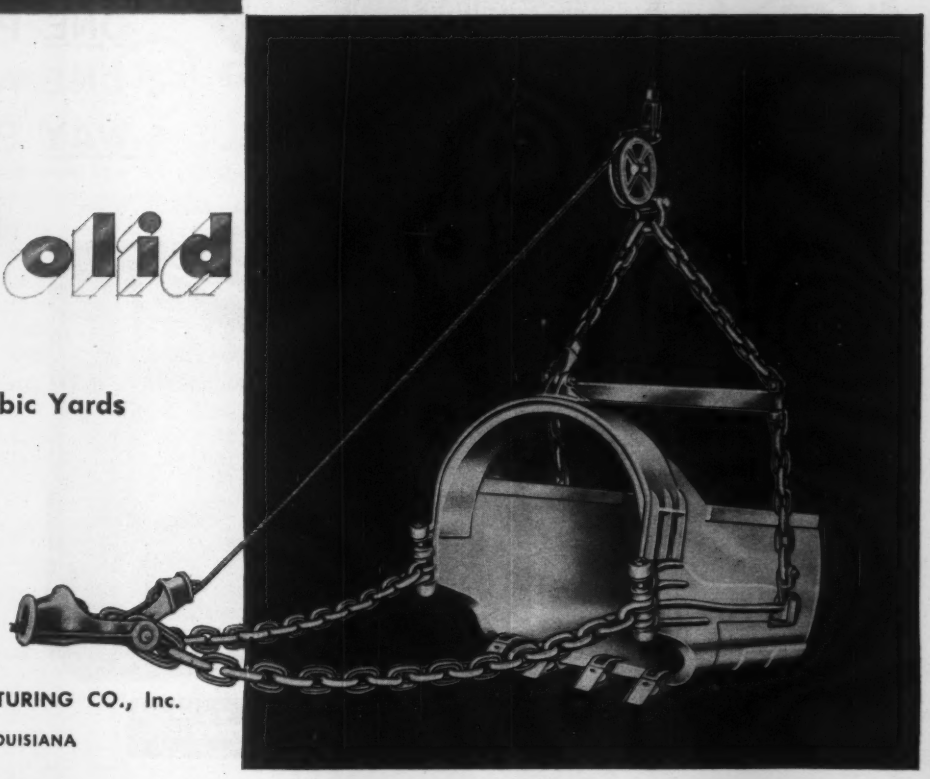

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MANSFIELD, LOUISIANA

(Continued from page 162)

▲ **Calif., Sacramento**—ART BLDG. ADDN.—State Div. Architecture, 1120 N St., Sacramento, art bulg. addn., Sacramento State College. $1,006,800.

▲ **Calif., Sacramento**—CENTRAL OFFICE—State Div. Architecture, 1120 N St., Sacramento, central office. $1,155,700; pipe line to incorporate California Hy. Acamedy area with City of Sacramento sewage facilities, $120,450. California Highway Patrol and Military Department.

▲ **Calif., San Diego**—LIFE SCIENCE and PSYCHOLOGY ADDN.—State Div. Architecture, 1120 N St., Sacramento, life science and psychology bldg. addn. $3,817,000, physical education addn. $644,750, 400 parking spaces $90,000, San Diego State College.

▲ **Calif., San Jose**—WOMEN'S GYMNASIUM ADDN., etc.— State Div. Architecture, 1120 N St., Sacramento, women's gymnasium addn. $2,090,100; Second Phase, expansion of steam distr. sys. $120,000; grading, planting and sprinkling sys. $133,500, San Jose State College.

▲ **Calif., San Luis Obispo**—ENGINEERING BLDG., etc. —State Div. Architecture, 1120 N St., Sacramento, engineering bldg. $2,928,300, administration-classroom $1,544,000, physical science bldg addn. $611,800, English and speech wing $440,750, California State Polytechnic College, San Luis Obispo Campus.

▲ **Calif., Santa Cruz**—PERMANENT CAMPUS—Cabrillo Junior College Dist., 315 Third Ave., Watsonville, bond election June 7, constr. permanent campus and all appurtenant bldgs. for Cabrillo Junior College. $6,600,000. Ernest J. Kump & Masten & Hurd & Gwathmey, 526 Powell St., San Francisco, archts.

▲ **Calif., Stockton**—HOSPITAL ADDN.—State Div. Architecture, 1120 N St., Sacramento, 200 bed addn. to Cottage G $2,300,000, 10,000 sq. ft. prefabricated metal property warehouse $98,500, maintenance equipment warehouse $171,350, Stockton State Hospital, Department Mental Hygiene. CD 2/4/57.

▲ **Calif., Ventura**—LIVING UNITS, etc.—State Div. Architecture, 1120 N. St., Sacramento, two living units, $831,500; addnl. vocational shops, $183,800, Ventura School for Girls, State Youth Authority. CD 12/4/58.

▲ **Calif., Whittier**—FOOD SERVICE, etc.—State Div. Architecture, 1120 N St., Sacramento, food service bldg., $674,000; two living units, $573,000; library and classroom, $424,200; swimming pool shower facilities and dressing room facilities, $116,000, Fred C. Nelles School for Boys, State Youth Authority. CD 8/7.

▲ **Colo., Grand Junction**—SCIENCE, etc.—State Planning Division, State Capitol Bldg., Denver, plans by Atchison & Kloverstrom, 257 Josephine St., Denver, science bldg., $900,000; plans by Van Deusen & Bliska, 421 Glenwood Ave., Grand Junction, student center, $700,000, for Mesa College.

▲ **Colo., Fairview** — SCHOOLS — Fairview School Dist. voted $1,500,000 bonds Apr. 26, schools. CD 4/11.

▲ **Ill., Wheaton**—HOME—DuPage Co., 201 Reber St., Wheaton, bond election Nov. 8, county convalescent home. $5,000,000. Bond election date extended. CD 3/25.

▲ **Kan., Liberal**—HOSPITAL—City, City Hall, voted bonds Apr. 5, 75-bed brick, concrete, etc. Citizens Hospital. $1,700,000. McVay, Peddie, Schmidt & Assocs., 1832 E. 2nd St., Wichita, archts. Bids in Fall of 1960. CD 4/14.

▲ **Kan., Merriam**—SCHOOLS—Bd. Educ. Shawnee-Mission Dist. High Schools, 7401 Johnson Dr., plans by Neville, Sharp & Simon, 25 E. 12th St., Kansas City, Mo., and Perkins & Will, 309 W. Jackson, Chicago, Ill., Junior High School, Lenexa, $1,750,000; plans by Marshall & Brown, 1016 Baltimore, Kansas City, Mo., and Perkins & Will, 309 W. Jackson, Chicago, Ill., Shawnee-Mission West Senior High School, Overland Park, $4,000,000.

▲ **Ky., Lexington**—WOMEN'S RESIDENCE HALL, etc.— Commonwealth of Ky., Div. Purchases, Frankford, plans by Meriwether, Marye & Assoc., 248 E. Shore St., 4 story, 197 x 207 ft., brick, rein.-con., frame and slabs Women's Residence Hall No. 6 of Central Dining Unit, University of Kentucky. $1,200,000. Staggs & Fisher, 508 E. Main St., consult. engrs.

▲ **Ky., Richmond**—LABORATORY—Commonwealth of Ky., Div. Purchases, Frankfort, plans by Meriwether Marye & Assoc., 248 E. Short St., Lexington, 1 and 2 story, brick, rein.-con., 75,000 sq. ft. laboratory, Eastern State College. $1,300,000. Staggs & Fisher, 508 E. Main St., Lexington, consult. engrs.

▲ **Mass., Pittsfield**—HIGH SCHOOL—City, School Dpt., 43 East St., plans by John H. Fisher, 29 Wendell Ave., Crosby Junior High School. $1,850,000. CD 10/14.

▲ **Mich., East Lansing**—FOOD PROCESSING and AGRICULTURAL MACHINERY EXHIBIT HALL—State, State Bldg. Dpt., Lewis Case Bldg., Lansing, plans by Ralph Calder & Assocs., 1212 Kales Bldg., Detroit, 150,000 sq. ft. concrete food processing and agricultural machinery exhibit hall, Michigan State University. $1,500,000. CD 10/11/57.

▲ **Minn., New Ulm**—SCHOOL—Bd. Educ., defeated $2,600,000 bonds Apr. 26, schools. CD 4/8.

▲ **Minn., Osseo**—SCHOOL, etc.—Bd. Educ. Independent School Dist. No. 279 plans by Matson & Wegleitner, 3701 Wayzata Blvd., Minneapolis, 3 story, 60,000 sq. ft. high school addn., 1 story, 30,000 sq. ft. administration-shop, etc. $1,200,000. Constr. 1960.

▲ **N. J., Laurelton**—SCHOOLS—Bd. Educ., Brick Twp., Bridge Rd., plans by Alfonso Alvarez, 204 Bellevue Ave., Upper Montclair, high school, Chambers Bridge Rd., Brick Twp., $1,000,000; elementary school, Drum Point Rd., Brick Twp., $1,000,000. CD 12/1.

▲ **N. J., Newark**—LIBRARY—City, City Hall, Broad St., main library addn., Washington St., $1,000,000; library branch at Belmont Ave. and Jones St., $400,000; 2 story branch library for Lincoln Park South Broad St. area, $400,000.

▲ **N. J., Newark**—SCHOOL—City, City Hall, Broad St., Bd. Educ., 31 Green St., plans by Wm. E. Lehman, 922 Broad St., elementary school, Monmouth St. $3,000,000.

▲ **N. J., New Brunswick**—SCHOOL OF EDUCATION— Rutgers University, Old Queens, plans by John Diehl-Francis R. Stein, 40 Witherspoon St., Princeton, School of Education, Seminary Place between College Ave. and George St. $1,200,000. CD 3/8/51.

▲ **N. Y., Amityville**—SCHOOL—Bd. Educ., referendum vote June 18, Junior High School. $2,500,000. Knappe & Johnson, 2110 Northern Blvd., Manhasset, archts. CD 4/10/58.

▲ **N. Y., Lackawanna**—HOUSING—Lackawanna Municipal Housing Auth., 150-unit housing. $2,250,000.

▲ **N. Y., New York**—HOUSING—New York City Housing Auth., 299 Broadway, Zone 7, plans by F. P. Wiedersum Assocs., 65 Roosevelt Ave., Valley Stream, Mary K. Simkhovitch Houses, Proj. NYC-36, 775 units. $8,000,000. To go ahead September 1960. CD 7/21/58.

▲ **N. Y., New York**—HOUSING—New York City Housing Auth., 299 Broadway, Zone 7, plans by Kelly & Gruzen, 10 Columbus Circle, Zone 19, 407-unit Baychester Houses Proj. NYS-92, Bronx Boro. $8,000,000. CD 3/2/59.

▲ **N. Y., St. George**—COMMUNITY COLLEGE—Bd. Higher Educ., 535 E. 80th St., New York, Zone 21, plans by A. Gordon Lorimer, 254 W. 54th St., New York, Zone 19, and Moore & Hutchins, 800 Second Ave., New York, Zone 17, HN-121-site development and buildings for Staten Island Community College, 50 Bay St., Richmond Boro. $6,000,000.

▲ **N. Y., West Seneca**—SCHOOL—West Seneca School Bd., 3330 Seneca St., defeated bonds Apr. 26 combined Junior High-Elementary School. $3,421,000. Pfohl, Stoll & Roberts, 185 Niagara St., Buffalo, archts. CD 3/30.

▲ **N. C., Albemarle**—SCHOOLS—Stanly County School Bd., Albemarle, voted $3,000,000 bonds Apr. 23, W. Badin Consolidated School $900,000; Locust Consolidated School $900,000; South Oakboro School $900,000. CD 3/21.

▲ **O., Cincinnati** — HOSPITAL — City, City Hall, $17,000,000 bond election Nov. 8, General Hospital alterations, addns. CD 4/13.

▲ **R. I., Pawtucket**—SCHOOL—City, City Hall, Garden St. School. $1,000,000. Constr. 1961.

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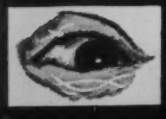

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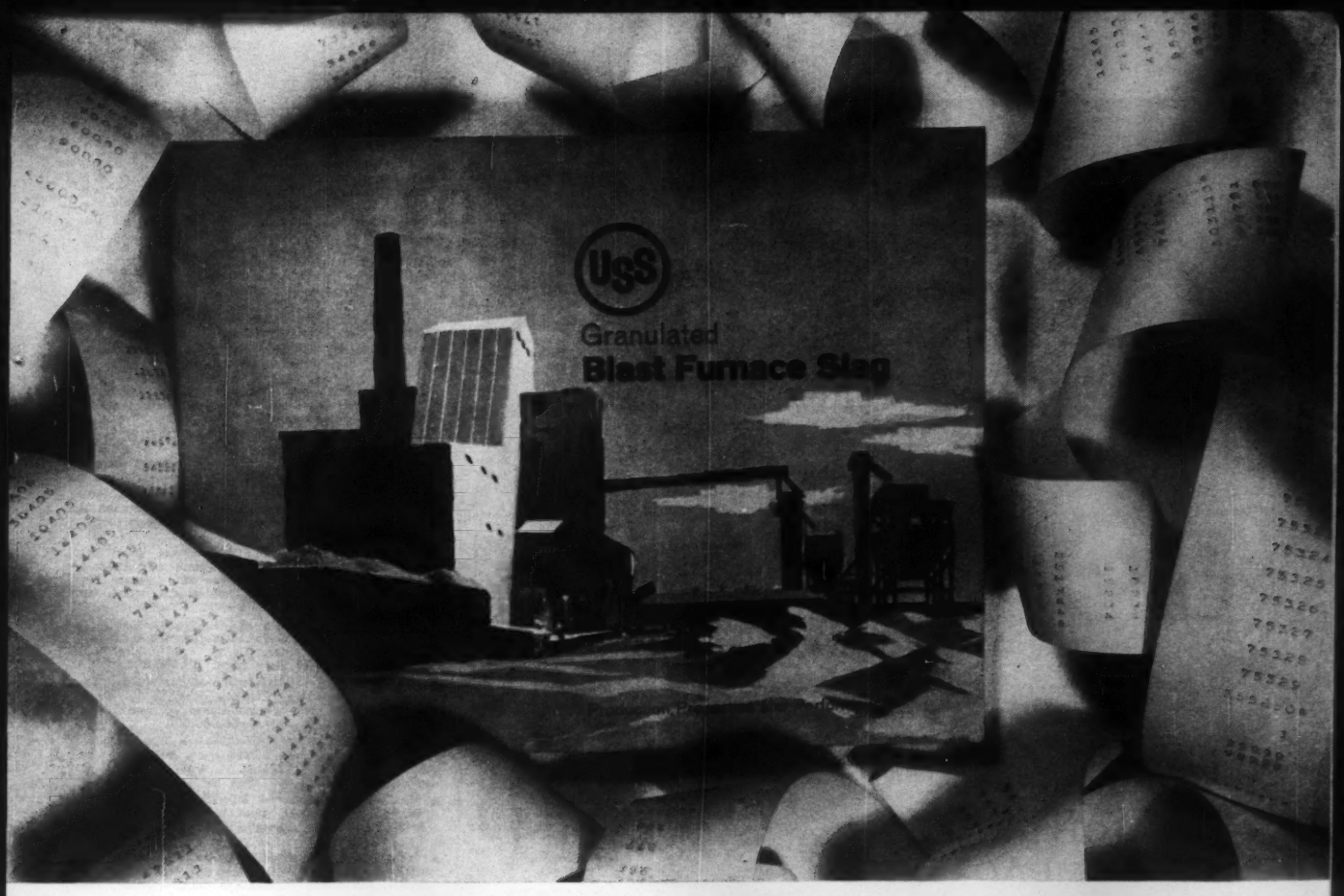

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(Continued from page 164)

▲ **S. C., Anderson**—HIGH SCHOOL—Anderson School Dist. 5, S. Fant St., plans by John M. Lambert, 121 Sharpe St., Girls' High School. $1,500,000. Associated Engineers, Inc., P.O. Box 5147, Greenville, plbg. and htg. engr. Industrial Electric Consultants, P.O. Box 5151, Station B, Greenville, elec. engrs. CD 11/23.

▲ **Tex., Electra**—SCHOOL—Electra Independent School Dist., Electra, plans by Caudill, Rowlett, Scott & Assocs., 3400 Montrose Ave., Houston, school. $1,350,000. CD 2/12.

▲ **Tex., Harlingen** — SCHOOLS — Harlingen Independent School Dist., Harlingen, voted bonds Apr. 16, Elementary School No. 1, $420,000; Junior High School, $708,000; Elementary School No. 4, $425,000; Elementary School No. 3, $432,000; Elementary School No. 2, $400,000. CD 4/8.

▲ **Wis., Janesville**—JUNIOR HIGH SCHOOL—Bd. Educ., plans by Childs & Smith, 20 N. Wacker Dr., Chicago 6, Ill., Junior High School. $1,100,000. Constr. in Fall.

▲ **Wyo., Casper** — SCHOOLS — Casper-Midwest School Dist., 10 and Elm Sts., plans by Architectural Guild, 829 CY Ave., Junior High School, $1,000,000; plans by Krusmark & Krusmark, 525 E. Railroad Ave., and Perkins & Will, 309 W. Jackson St., Chicago, Ill., high school, $1,500,000.

▲ **Que., Montreal**—SCHOOL LIBRARY—Montreal Catholic School Comn., 3737 Sherbrooke St. E., plans by E. A. Doucet, 2245 Sherbrooke St. E., 3 story 426,000 sq. ft., brick, rein.-con. frame, concrete school library, Sherbrooke St. E. Over $1,000,000.

▲ **Que., Shawinigan** — HOSPITAL — Provincial Dpt. Health, Parliament Bldgs., Québec City, hospital, $2,000,000.

COMMERCIAL BUILDINGS

▲ **Ala., Montgomery** — DEPARTMENT STORE — Sears, Roebuck & Co., 295 S. Homan St., Chicago, Ill., department store, Court St. and Fairview Ave. $2,000,000.

▲ **Alaska, Juneau**—HOMES, SHOPPING CENTER, etc.—Stone & Schulte, Inc., 1745 W. San Carlos St., San Jose, Calif., 2,000 homes, shopping center and resort hotel. $45,000,000.

▲ **Ark., Pine Bluff**—SHOPPING CENTER—Gus Blass, 4 and Main Sts., Little Rock, plans by Erhart, Eichenbaum, Rauch & Blass, 201 Chester St., Little Rock, 170,000 sq. ft. Jefferson Square Shopping Center, incl. department store, bank, offices, etc., 27, Main, 29 and Olive Sts. $1,500,000. Bids in June. CD 1/13.

▲ **Calif., Perkins**—HOMES, etc.—Owner, c/o Oliver Rousseau Organization, 153 W. Jackson, Hayward, plans by Joseph E. Spink, 997 5th St., Sacramento, 1,200 home Subdivision, to incl. apartment house and motel development and commercial development, College Greens. $2,227,500.

▲ **Calif., San Francisco** — MEDICAL OFFICE — Owner, c/o John G. Kelley, archt., 2155 Powell St., 5 or 6 story, 25,000 sq. ft. medical office, incl. 2 level garage, California and Webster Sts. $1,000,000.

▲ **Calif., West Covina**—HOSPITAL—Sisters of the Immaculate Heart of Mary, c/o Verge & Clatworthy, archts., 4342 Eagle Rock Blvd., Los Angeles, 4 story, 100,000 sq. ft., rein.-con. Queen of the Valley Hospital. $2,000,000.

▲ **Fla., St. Petersburg** — APARTMENT, etc. — George Babin, 115 6th St. N., plans by John B. Gay, 7217 Gulf Blvd., St. Pete Beach, 10 story, steel, concrete apartment, swimming pool, parking, $5,500,000.

▲ **Fla. St. Petersburg**—APARTMENTS—Pasadena Apartment Co., c/o Borleman & Rapp, archts., 1216 E. Colonial Dr., Orlando, 5 story, 260,860 sq. ft. Pasadena Apartments, swimming pool, $3,000,000. Cole Engineering Corp. of St. Petersburg, 4146 Central Ave., consult. engrs.

▲ **Fla., Winter Park**—APARTMENT—Owner, c/o Broleman & Rapp, archts., 1216 E. Colonial Dr., Orlando, 4 story, 74-unit, Lake Virginia Apartment, Osceola Ave. and Ollie Ave. $1,100,000.

▲ **Ill., Chicago**—SEMINARY—Trinity Seminary & Bible College, 1726 Berteau Ave., plans by Johnson & Johnson, 111 W. Washington St., seminary addns. $1,500,000. CD 8/12/58.

▲ **Ill., Mount Prospect**—OFFICES—United Air Lines, 5959 S. Cicero Ave., Chicago, plans by Skidmore, Owings & Merrill, 30 W. Monroe St., Chicago, Zone 3, 2 story, 370,000 sq. ft. offices, Elk Grace Twp. $8,000,000. Bids in June.

▲ **Kan., Wichita** — MOTOR HOTEL, etc. — Owner, c/o Preston P. Reynolds & Walter W. Anschlager, archts., 2505 Turtle Creek Blvd., Dallas, Tex., White Plaza Motor Hotel and 19 story office. $9,500,000.

▲ **Md., Baltimore**—APARTMENT—Mullan Contg. Co., 3945 Greenmount Ave., Zone 18, plans by Jos. Faust, c/o owner, 20 story air-conditioned apartment, 39th St. and Charles St. Approx. $6,000,000

▲ **Md., Wheaton** — OFFICE — Wheaton Plaza Regional Shopping Center, Inc., 11160 Viers Mill Rd., plans by A. L. Anderson, 1726 M St. N.W., Wash., D. C., office. $1,000,000. CD 4/21/59.

▲ **N. J., Eatontown**—APARTMENTS—Mark D. Handler, Ray Dr., Toms River, plans by A. Pancani, Jr., 3 Briar Hills Circle, Springfield, apartments, Pinebrook Rd. $3,000,000.

▲ **N. J., Neptune**—HOUSES—Reliance Associates, c/o Harry Giherson, 640 Matison Ave., Asbury Park, 65 houses, Asbury Ave. $1,200,000. Claude Birdsall, 1700 F St., Belmar, consult. engr.

▲ **N. J., Neptune**—HOUSES—S & H Constr. Co., Sylvania Ave., Neptune City, 400 houses on north side of West Bangs Ave. $4,000,000. Claude W Birdsall, 1700 F St., Belmar, consult. engr.

▲ **N. Y., East Northport** — CHURCH, etc. — Diocesan Bldg. Office, 253 Sunrise Hy., Rockville Centre, plans by Ballard, Todd & Snibbe, 123 E. 77th St., New York, Zone 21, church and convent for St. Anthony of Padua Parish. $1,000,000.

▲ **N. Y., New York**—APARTMENT—Bailey Constr. Corp., George Rabinor, pres., 1581 Irving Pl., Woodmere, plans by Tito D. Vincenzo, 136 E. 57th St., Zone 22, apartment, Bailey Ave. south of Van Cortlandt Park South, Bronx Boro. $1,500,000.

▲ **O., Columbus**—CONVENT—Sisters of Convent of Good Shepherd, 31 South Sandusky, convent on 32-acre site besides Alum Creek, Mifflin Twp. $1,250,000.

▲ **S. C., Anderson**—SHOPPING CENTER—Max F. Stewart, 608 Glenwood Ave., plans by H. Harold Tarleton, Jr. & Associates, P.O. Box 5265, Station B, Greenville. 112,000 sq. ft. shopping center. $1,000,000. Associated Engineers, Conway Bldg., Greenville, consult. engrs. CD 5/27/59.

▲ **Tex., Dallas**—HOSPITAL—Dr. Philip E. Whittlessey, Jr., 2623 N. Haskell Ave., plans by Fisher & Jarvis, 2623 N. Haskell Ave., Southaven Memorial Hospital, S. Beckley and Ledbetter Dr. $2,500,000.

▲ **Tex., Fort Worth**—DWELLINGS—Hallmark Developers, 166 Afton Rd., three hundred 1 story, brick veneer, dwellings, approx. 1,600 sq. ft. fl. space in Hallmark addn. Sect. 4. Over $2,250,000. C. A. West, 109½ Main St., consult. engr.

▲ **Tex., Fort Worth** — RESIDENCES — A. A. Jackson, 3900 Woodlane, one hundred 1 story, brick veneer residences, approx. 1,200 sq. ft. fl. space in Edgewood Park Addn. Over $1,000,000.

▲ **Tex., Houston**—OFFICES—Houston Petroleum & Trade Center, Bd. Directors, 3100 Audley St., plans by Lightfoot-Burleson & Associates, 3100 Audley St., 8 story office; 7 story office; two 2 story offices, ten 1 story office, masonry type, 342,000 sq. ft. Site 26 acres at Brays Bayou and Maxwell Lane, $7,000,000.

▲ **Tex., Houston**—SUPERMARKET, etc.—J. Weingarten, Inc., 600 Lockwood St., supermarket, $2,500,000, not for immed. constr.; paved area and auto center, $100,000; site area earthwork, $65,000, at Westheimer and Hillcroft.

▲ **Tex., San Antonio**—MOTOR HOTEL—Pan Tex (Hotel Corp.) Tom Herring, 7007 San Pedro Ave., plans by Wallace B. Thomas, 7007 San Pedro Ave., motor hotel, 2-level, masonry parking garage, $1,000,000.

▲ **Va., Hampton**—CHURCH, etc.—West Hampton Baptist Church, 631 Aberdeen Rd., church, classrooms. $1,000,000.

▲ **Va., Richmond**—THEATRE, etc.—Childrens Theatre, Inc., 8911 Norwock Rd., 1,500 seat theatre, and office, $1,000,000.

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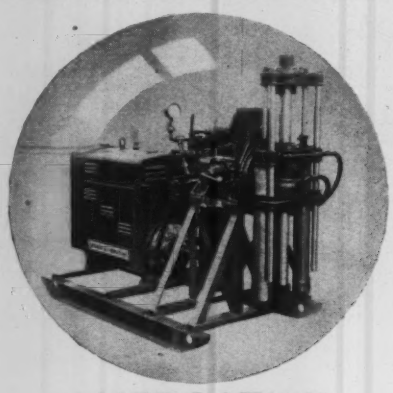

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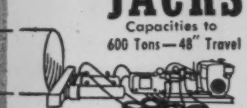

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▲ **Wash., Spokane**—DEPARTMENT STORE—E. D. McCarthy, Inc., W. 720 Boone St., plans by Miller & Holloway, W. 720 Boone St., 600,000 sq. ft. department store in Northtown shopping center. **$1,000,000.** The Crescent, lessee. CD 3/1/57.

▲ **Ont., Ottawa**—HOSPITAL—Little Company of Mary of Jesus, c/o Mrs. O'Neil, 15 LeBreton St., plans by Auguste Martineau & Associates, 72 Queen St., 500-bed hospital, Baseline Rd. **$5,000,000.** CD 1/27.

▲ **Ont., Toronto** — HOSPITAL — Bethesda General Hospital, 325 Sheppard Ave. W., 170-bed hospital, Sheppard Ave. **$2,642,000.**

▲ **Ont., Toronto**—SCHOOL—The Salvation Army, 20 Albert St., plans by Marani, Morris & Allan, 1250 Bay St., training school, Bayview Ave. **$1,500,000.** Reicher, Bradstock & Assocs., 600 Eglinton Ave. E., consult. engrs. CD 4/7.

▲ **Que., Beaconsfield**—HOUSING—Continental Housing Corp., 1050 J. J. Joubert Ave., Duvernay, housing program, Laurier Court Proj. **$1,000,000.**

▲ **Que., Montreal**—HOSPITAL—Hospital Notre Dame De L'Esperance, c/o Duplessis, LaBelle & Derome, archts., 6655 Cote Des Neiges Rd., 7 story, rein.-con. frame, hospital extension, **$3,000,000.** CD 2/4.

▲ **Que., Montreal**—CLUBHOUSE, etc.—St. James's Club of Montreal, 675 Dorchester Blvd. W., 12 story clubhouse and office, Dorchester Blvd. **$1,500,000.**

▲ **Que., Quebec City**—GYMNASIUM—University of Laval, Quebec City, plans by Jean Marie Roy, 3001 St. Louis Rd., Ste. Foy, gymnasium, Ste. Foy, **$1,000,000.** CD 1/2/48.

▲ **Sask., Saskatoon**—HOSPITAL—St. Paul's Hospital Bd. Governors, plans by Green, Blankstein, Russell & Assocs., 222 Osborne St. N., Winnipeg, Man., hospital, **$6,000,000.** CD 10/4/57.

INDUSTRIAL BUILDINGS

▲ **Ga., Savannah**—PASSENGER STATION, etc.—Seaboard Airline Railroad Co., 3600 W. Broad St., Richmond, Va., passenger station and office. **$2,000,000.** T. S. Williams, 3600 W. Broad St., Richmond, Va., engr.

▲ **Ky., Owensboro** — WAREHOUSE, etc. — General Elec. Co. (Owensboro Tube Works), 319 E. 9th St., plans by Lennox-Mathews, Simmons & Ford, Inc., 3949 Meadow Dr., Indianapolis, Ind., 146,000 sq. ft. manufacturing and warehouse, incl. kitchen and cafeteria bldg. Over **$1,000,000.** CD 6/7/57.

▲ **Me., Easton**—PLANT—F. H. Vahising Co., Alfred Litz, Station St., potato processing plant. **$1,100,000.** Constr. 1960.

▲ **Me., Presque Isle**—PLANT—Potato Service, Inc., P.O. Box 949, potato processing plant. **$1,100,000.** Constr. 1960.

▲ **Minn., Fridley**—FACTORY, etc.—Maico Electronics, Inc. (sub. W. A. Sheaffer Pen Co., Ft. Madison, Iowa), 21 North 3rd St., Minneapolis, 150,000-200,000 sq. ft. factory and office. **$1,500,000.**

▲ **N. J., Freehold**—MFG. PLANT, etc.—Minnesota Mining & Manufacturing Co., 400 McKnight Rd., St. Paul, Minn., soon lets contract magnetic tape mfg. plant, warehouse, office, railroad siding and track, paving. **$1,500,000.** Irving S. Towsley, 1428 S. Penn Square, Phila., Pa., engr. CD 4/3.

▲ **Tenn., Nashville**—PLANT ADDN.—Western Electric Co., Polk Ave., 125,000 sq. ft. plant addn., **$1,800,000.**

▲ **Wash., Kalama**—GRAIN ELEVATOR—Port of Kalama, 2 m. bu. export grain elevator, with dock and barge facilities. **$4,000,000.** North Pacific Grain Growers, Inc., lessee.

UNCLASSIFIED

▲ **N. Y., Flushing**—STADIUM—Dpt. Parks, Arsenal Bldg., Central Park, 64th St. and 5th Ave., New York, Zone 21, plans by Jim Nash Assocs., Inc., 527 Madison Ave., New York, N. Y., 53,000 seat stadium at north end of Flushing Meadow Park between Grand Central Parkway and 126th St. from Roosevelt Ave. to Northern Blvd. **$15,000,000.** Praeger-Kavanagh-Waterbury, 126 E. 38th St., New York 16, N. Y., consult. engrs. CD 11/30.

▲ **N. Y., New York**—NEWSPRINT SHIPPING TERMINAL—Dpt. Marine & Aviation City of New York, Battery Maritime Bldg., Zone 4, 165x630 ft. newsprint shipping terminal, incl. 1 story transit shed north of Montgomery St. on sites of Piers 39, 40, 41, 42 and 43, East River, Proj. D-275. **$2,380,000.** Tippetts, Abbett, McCarthy & Stratton, 375 Park Ave., Zone 22, engrs.

▲ **Pa., Phila.**—TERMINAL—Dpt. Procurement, City Hall Annex, plans by Ballinger Co., 1625 Race St., Marine Cargo Terminal Piers 38-40 South, **$2,337,000.** Joseph S. Ward & Assoc., 91 Roseland Ave., Caldwell, N. J., consult. engrs. CD 11/12/52.

▲ **Tenn., Bristol**—POWER LINES—Bristol Power Bd., Bristol, underground power lines, **$1,150,000.** E. Barrett Foster, Sheffield, Ala., consult. engr. for first phase. CD 3/15.

▲ **Va., Newport News** — PIER — Virginia State Ports Auth., State Office Bldg., Richmond, pier. **$18,000,000.** C & O Railroad, lessee.

▲ **Ont., Toronto**—TELEVISION STATION—Baton Aldred Rogers Broadcasting Ltd., c/o Toronto Telegram, Bay and Melinda Sts., plans by Barnett & Rieder, 96 Eglington Ave. E. 220 x 300 ft., steel frame, masonry television station, McCowan Rd. **$1,000,000.** C. D. Carruthers & Wallace Consultants Ltd., 92 Yorkville Ave., consult. engrs. CD 4/5, under Commercial Buildings.

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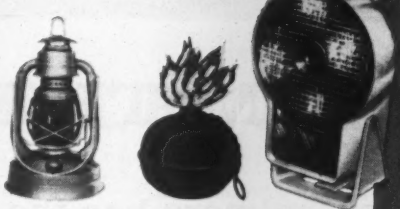
now is the time to properly light your construction hazards

USE THE DIETZ 3 WAY HAZARD WARNING SYSTEM



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Use Dietz Lanterns to locate hazard in relation to driver's position. Show exact location, shape, extent, and boundaries of hazard area. Burn up to 100 hours.

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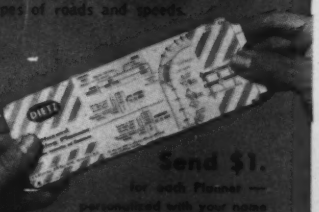

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CHOOSE FROM THE WORLD'S

Allis-Chalmers has the machine that best fits your material handling needs . . . 5 tractor loaders and 4 tractor shovels—ranging from 1 to 7¼ cu yd . . . 72 to 225 net engine hp.

2 and 4-wheel drive tractor loaders—76.5 to 130 hp—each with a family of buckets to choose from.

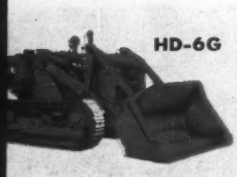
. OR TRACK

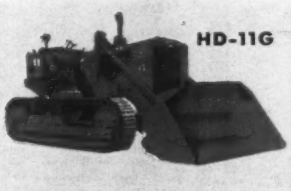
MOST COMPLETE LINE

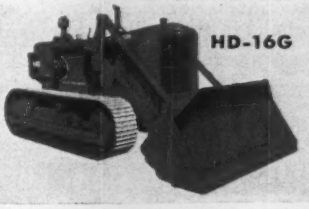
Allis-Chalmers offers you the world's most complete line of tractor shovels and loaders on the market today. *On Rubber*, you choose from 5 loader models ranging in power from 76.5 to 130 hp; in capacity, from 1 to 5 cu yd. *On Track*, Allis-Chalmers tractor shovels are available from 72 to 225 hp, 1½ to 7¼-cu-yd capacities. All models offer a variety of buckets and bucket sizes.

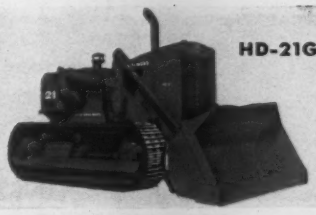
Inside the plant or in the yard, you can rely on Allis-Chalmers loaders to help you solve your material handling problems. All models benefit from design, construction and operating advantages that come from Allis-Chalmers' experience as the industry's leading builder of tractor shovels and loaders.

From one source—your Allis-Chalmers construction machinery dealer—get the loader that's best for you. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.


HD-6G


HD-11G


HD-16G


HD-21G

Big, rugged tractor shovels—72 to 225 hp—1½ to 7¼-cu-yd buckets.

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T-16 OPTICAL TRANSIT

In any comparison of optical and mechanical precision, features and versatility, three characteristics of this repeating transit become immediately evident:

The Wild T-16 is faster, more accurate, and much easier to work with than any other instrument in its price class.

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CONSTRUCTION REPORTS

Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS

May 25 Maine

May 26 New Hampshire

June 1 Massachusetts

BUILDINGS—BA

▲ **Conn., New Haven** — RESIDENTIAL COLLEGES — BA 6/1—Yale University, 105 Wall St., two 4 story, stone residential colleges, Tower Sq. $4,500,000. Eero Saarinen & Assocs., 1300 N. Woodward St., Birmingham, Mich., archts. Henry A. Pfisterer, 111 Whitney Ave., engr. CD 3/4/59.

▲ **Conn., East Hartford** — SCHOOL — BA 6/2 — Town, School Bldg. Com., 740 Main St., Junior High School wing of South End Junior-Senior High School. $2,000,000. Plans deposit $100. Extended date. CD 4/28.

HEAVY CONSTRUCTION—LB & CA

▲ **RHODE ISLAND**—State R. I. & Providence Plantations, Div. Purchases, State House, Providence, **M. A. Gammino Constr. Co.**, 728 Valley St., Providence, R. I., CA **$3,857,534**, est. $3,900,000, Interstate Rte. 95 Bid No. 839, Contr. No. 6053, FAP 1-95-2(3) 36, Providence Co. Bids Apr. 20. CD 4/25, under LB.

BUILDINGS—LB & CA

▲ **Vara Constr. Co.**, 718 Huntington Ave., Boston, Mass., CA **$2,698,786**, Enfield HIGH SCHOOL, ENFIELD, CONN. Town, Town Hall, N. Main St., Thompsonville, Conn. Bids Mar. 15. CD 3/18, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

June 1 New Jersey

STREETS AND ROADS

June 1, 2 New Jersey

BUILDINGS—BA

▲ **N. Y., Levittown**—HIGH SCHOOL—BA 5/31—Bd. Ed. Unif. Free School Dist. No. 5, Town of Hempstead, high school, $2,250,000. Plans deposit $100 for general, $50 mechanical trades. Louis E. Jallade, 597 5th Ave., New York, N. Y., archt. CD 3/1.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—State Dpt. P. Wks., State Office Bldg., Albany, **Fehlhaber Corp. & Terry Contg., Inc.**, 217 E. 49th St., New York 17, N. Y., CA **$10,830,123**, rein.-con. slab roadway on viaduct 0.8 mi., misc. work 0.02 mi. sheet aspht. pavt. 0.82 mi. alter and strengthen elevated steel struct. 80 spans, 4,216 ft. Int. Rte. Conn. 512 Gowanus Expressway (20th to 36th Sts.) Int. Rte. 278, FIGE 60-2 Proj. L-278-1 (47), Kings Co. Bids Mar. 17. CD 3/18, under LB.

BUILDINGS—LB & CA

▲ **William A. Berbusse Jr., Inc.**, 101 Park Ave., New York 17, N. Y., CA Est. **$2,000,000**, 5 story HOSPITAL and altering existing bldg. at site, BROOKLYN, N. Y. Lutheran Medical Center, 4520 Fourth Ave., Brooklyn 20, N. Y. Rogers & Butler, 219 E. 44th St., New York 17, N. Y., archts. CD 2/16/59.

▲ **Bailey & Bailey**, 45 W. Park Ave., Long Beach, N. Y., Owner Builds, **$2,000,000**, SHOPPING CENTER and parking area, FAR ROCKAWAY, N. Y. Donald Bailey, 1 W. Park Ave., Long Beach, N. Y., archt. CD 7/17/56.

▲ **89th Street Assocs., Inc.**, 151 E. 17th St., New York 3, N. Y., Separate Contracts. **$2,000,000**, 18 story APARTMENT, 401-7 East 89th St., NEW YORK, N. Y. Philip Birnbaum, 12 East 48th St., New York 17, N. Y., archt. CD 7/10.

▲ **Jos. L. Muscarelle, Inc.**, Essex St. and St. Hy. 17, Maywood, N. J., CA **$2,000,000**, NEWSPRINT PLANT, off River Rd., GARFIELD, N. J. Garden State Paper Co., 207 Market St., Newark, N. J., Roderick O'Donoghue, 420 Lexington Ave., New York, N. Y., engr. CD 12/3.

▲ **Wigton Abbott**, South Ave., Plainfield, N. J., CA, LABORATORY ADDN., Columbia Rd., MORRISTOWN, N. J. Allied Chemical Corp., General Chemical Division, 61 Broadway, New York 6, N. Y. Fellheimer & Wagner, 155 E. 42 St., New York, N. Y., archts.

▲ **Arthur Bothers**, 236 Dukes Parkway, Somerville, N. J., Owner Builds, **$2,000,000**, 90 HOUSES, Old Neshanic Village, off Riverside Dr., Hillsborough Twp., SOMERVILLE, N. J. George E. Johnson, R. D. No. 1, Lebanon, N. J., archt. Tectonic Assocs., U. S. Hy. 206, Somerville, N. J., engr.

▲ **Ben F. Schwartz operating as Franklin Point Heights**, 18 Hamilton St., Bound Brook, N. J., Owner Builds, **$2,000,000**, 100 HOUSES on streets off Amwell Rd., Hillsborough, SOMERVILLE, N. J.

▲ **Charles Tompkins Co.**, 1737 K St. N. W., Wash., D. C., CA Est. **$2,500,000**, 3 story, brick, steel, concrete PHILANTHROPIC INSTITUTION, 6200 Nebraska Ave. N. W., WASH., D. C. Army Distaff Foundation, Inc., c/o Edwin Weihe, archt., 810 18th St. N. W., Wash., D. C.

(Continued on page 172)

NYGEN-BUILT

GENERAL TIRES

keep units rolling 'round-the-clock to build on-the-job profits!

When profits depend on constant operation, *you* can depend on the extra strength of the General Tire to bring you through *on time every time.* With Nygen cord construction to ward off bruise, cut and snag damage, the General Tire delivers unmatched traction and flotation, reduces down time to a minimum. Whether your next job is in sand, rock or mud, assure yourself top job profits with General Tires.

THE GENERAL TIRE & RUBBER CO. • Akron, O.

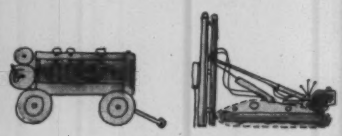
NEW SCHRAMM C-42 CRAWLER ROTADRILL SLASHES ROCK REMOVAL COSTS!

1 you get a completely self-contained, self-powered crawler unit... with air compressor built in

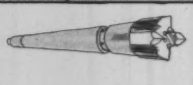
one man drills and drives...

2 you cut cost of:

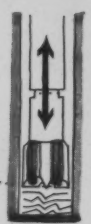
separate wagon drill and compressor



one or two extra men

3 with a Rotatool  **you get:**

blow at bottom of hole...



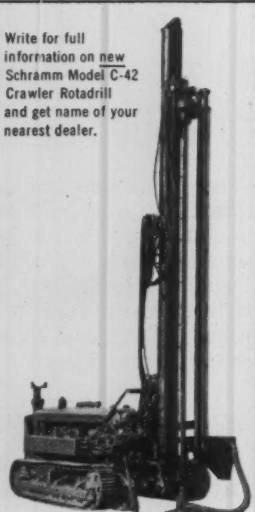
deeper, faster penetration

lower cost per cubic yard removed!

4 compare:

	MODEL C-42 ROTADRILL	CRAWLER WAGON DRILL
Air required	250 cfm	600 cfm
Hole size	4½"	4½"
Drill steel size	3¾"	2"
Equipment cost	$29,825.	$16,200 for crawler wagon drill $18,545 for 600 cfm compressor $34,745 total
Men needed	One	2 or 3

Write for full information on new Schramm Model C-42 Crawler Rotadrill and get name of your nearest dealer.



Schramm

ROTADRILLS AND ROTATOOLS

620 North Garfield Ave., West Chester, Pa.

(Continued from page 170)

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

May 27 Alabama

STREETS AND ROADS

May 26 Florida — May 27 Tennessee

June 2 Kentucky

BUILDINGS—BA

▲† **Tenn., Oak Ridge** — RADIOISOTOPE DEVELOPMENT LABORATORY—BA About 6/16—U. S. Atomic Energy Comn., Oak Ridge, constr. radioisotope development laboratory, Bldg. 3047, to consist 40x142x35 ft. built above ground with structural steel frame and concrete block walls; built-up roofing on steel deck; rolling steel doors; one 10x10 ft., one 8x10 ft. and one 7x10 ft.; one folding door, etc., Oak Ridge National Laboratory Area, Roane Co., Inv. No. 401-60-18A. Plans deposit $40. CD 3/31/59.

HEAVY CONSTRUCTION—LB & CA

▲ **Williams McWilliams,** Box 584, New Orleans, La., CA **$3,218,227,** Nashville Ave. wharf and approach trestles, incl. approx. 60,000 sq. yd. concrete oeck on steel bearing piles, NEW ORLEANS, LA. Port of New Orleans, No. 2 Canal St., New Orleans, La. Bids Apr. 19, awarded Apr. 28. CD 4/27, under LB.

BUILDINGS—LB & CA

▲ **H. F. Coble,** 1043 Legion Pl., Orlando, Fla., LB **$3,721,160** (5 bidders), 229 unit CAPEHART HOUSING, Naval Auxiliary Air Station, Whiting Field, MILTON, FLA. Dist. P. Wks. Office, 6th Naval Dist., Charleston, S. C. Joseph H. Bryson, 301-03 Greenleaf Annex, Jacksonville, Fla., archt. Bids May 11. CD 5/2.

▲ **Florida Builders,** 700 43rd St. S., St. Petersburg, Fla., CA **$3,000,000,** 12 story, 146,000 sq ft. OFFICE, BANK, 11 drive-in windows, parking area, ST. PETERSBURG, FLA. Citizens Plaza Corp., 700 43rd St. S., St. Petersburg, Fla. William B. Harvard, Blanchard, Jolly, 2714 9th St. N., St. Petersburg, Fla., archts. CD 1/21.

▲ **Keller Constr. Corp.,** 7900 Palm St., New Orleans, La., CA **$2,143,000,** 2 story, rein.-con., aluminum window wall SCIENCE BLDG., Louisiana State University, NEW ORLEANS, LA. State University, Administration Bldg., Lake Front, New Orleans, La. Bids May 5. CD 4/6.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

May 27 Illinois — June 2 Wisconsin

STREETS AND ROADS

May 24 Ohio — May 25 Michigan

May 27 Illinois — June 2 Wisconsin

June 7 Indiana

▲ **Ill., Chicago**—BA 5/25—Dpt. Purchases, City Hall, Zone 2, combined sewers, Wellington Ave. System. $2,600,000. B. C. Eilers, 320 N. Clark St., Zone 10, ch. engr. CD 11/6.

▲ **O., Youngstown**—BA 6/7—Bd. Comrs. Mahoning Co., Courthouse, McGuffey Rd. Bridge, $2,000,000. Samuel Gould, Jr., co. engr. CD 11/8/54.

BUILDINGS—BA

▲ **O., Cleveland**—SCIENCE CENTER—BA About 6/21—Western Reserve University, 2040 Adelbert Rd., Zone 6, science center. $5,494,770. Small, Smith, Reeb & Draz, 1010 Euclid Ave., Zone 15, archts. CD 1/12, under LB.

HEAVY CONSTRUCTION—LB & CA

▲ **Toledo—Lucas Co. Port Authority,** 240 Superior St., Toledo, O., rejected bids opened Mar. 28, grain elevator and appurtenances, dredging, bulkhead and fill with elevator to have headhouse and 42 rein.-con. bins, approx. 30 ft. dia., 130 ft. high, paving tracks, TOLEDO, O., LB **$5,585,334.** Will re-advertise. CD 3/31, under LB.

▲ **ILLINOIS**—Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldgs., Springfield,
Standard Paving Co., 308 W. Washington St., Chicago, Ill. CA **$2,269,466,** paving and four interchanges FAI 80 from Fox River easterly, LaSalle Co. Bids Mar. 18. CD 3/22, under LB.

▲ **Malan Constr. Corp.,** 2 Park Ave., New York 16, N. Y., CA **$3,794,000,** No. 80.85-59-108, Contract RB11, airport hangar, Eastern Airlines, Chicago O'Hare International Airport, Park Ridge, CHICAGO, ILL. Dpt. Purchases, City Hall, Chicago 2, Ill. Bids Mar. 4. Awarded May 4. CD 3/9, under LB.

BUILDINGS—LB & CA

▲ **Northmoor, Inc.,** c/o Beerman Realty Co., 224 N. Wilkinson, Dayton, O., Owner Builds, **$17,000,000,** HOUSING, 900 homes, Salem Pike, 1960-1963 Housing Program, DAYTON, O.

▲ **Roberts Lang & Gray, Inc.,** 5138 W. Madison St., Chicago 4, Ill., CA **$2,000,000,** PRINTING PLANT, FACTORY and OFFICE, 1224 W. Van Buren St. and 310 S. Racine Ave., Redevelopment, CHICAGO, ILL. Regensteiner Corp., 310 S. Racine Ave., Chicago, Ill. Friedman, Alschuler & Sincere, 223 W. Jackson

(Continued on page 175)

Concrete Adhesives With THIOKOL Liquid Polymer

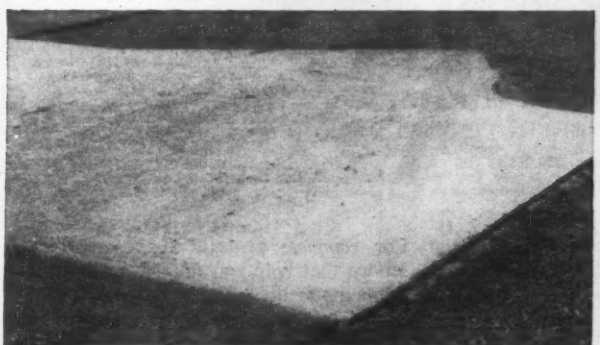
MAKE LITTLE OF BIG REPAIRS

1. Scaled highway surfaces are being lastingly repaired in only a few hours by bonding new concrete to old with adhesives containing THIOKOL polysulfide polymer. The bond is stronger than concrete itself. Field and lab tests prove it.

2. Only loose and damaged concrete—not the whole slab—need be removed. The adhesive also cuts time and costs in repairing spalled areas, cracks, pot holes, in skidproofing and sealing, in fastening traffic markers. Results are long-lasting.

3. Adhesive with THIOKOL liquid polymer—made and sold commercially by several processors—is spread on prepared surface with brooms or heavy brushes. Thirty minutes later, while adhesive is still tacky, new concrete is poured.

4. Concrete is laid conventionally. It can also be worked out to a feather-edge without danger of later failure—so tenacious is the adhesive bond of new to old concrete.



5. Repair completed—road open as soon as concrete is cured. Similar repairs, in service since 1953, show no damage or effects of weather, wear and tear, even on the busiest highways.

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Please send me THIOKOL'S helpful booklet "A New Type of Concrete-to-Concrete Bonding." Tells how to reduce remedial time and costs, and to keep roads in service.

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Firm_____

Street_____

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THE TRAVELERS

Insurance Companies HARTFORD 15, CONN.

(Continued from page 172)

Blvd., Chicago, Ill., archts. Awarded May 6. CD 2/10.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

May 25 Arkansas — May 27 North Dakota
June 2 Kansas — June 6 Oklahoma

STREETS AND ROADS

May 25 Arkansas — May 27 North Dakota
June 2 Kansas — June 6 Oklahoma

HEAVY CONSTRUCTION—LB & CA

▲ **Table Rock Enterprises, Inc.,** 916 Walnut St., Kansas City, Mo., LB Est. over **$3,000,000,** (1 bidder), lease and construct resort, lodge, swimming pool and skating rink, Table Rock State Park, MISSOURI. State Park Bd., Jefferson Bldg., 100 E. Capitol Ave., Jefferson City, Mo. Bids May 5. CD 3/16.

BUILDINGS—LB & CA

▲ **Bor-Son Constr., Inc.,** 7700 Logan Ave. S., Minneapolis, Minn., CA Est. **$7,000,000,** general contract, 400,000 sq. ft. SHOPPING CENTER, NE 37th Ave. between Silver Lake Rd. and Stinson Blvd., ST. ANTHONY, MINN. Apache Realty Corp., Thorpe Bldg., Minneapolis, Minn. W. D. Thorsen, 124 S. Fourth St., Minneapolis, Minn., archt. L. D. Freelund, Metropolitan Bldg., Minneapolis, Minn., engr. CD 12/23.

▲ **O. Madsen & Son, Inc.,** 492 Sexton Bldg., Minneapolis, Minn., LB **$2,534,000,** (5 bidders), 6 SCHOOLS, ST. PAUL PARK, MINN. Bd. Educ., Independent School Dist. 833 St. Paul Park, Minn. Bids Apr. 28. CD 3/24.

Healy Plumbing & Heating Co. Inc., 278 West Kellogg Blvd., St. Paul, Minn., LB **$996,700,** (4 bidders) plumbing and heating work all 6 schools (St. Paul Park, Minn.).

▲ **John Toland Co., Inc.,** 5300 Conway Pike, North Little Rock, Ark., Owner Builds, **$2,500,000,** 200 HOMES, Arrowhead Manor Subdivision, off Parkway Dr., NORTH LITTLE ROCK, ARK.

▲ **Henger Const. Co.,** Simons Bldg., Dallas, Tex., CA **$6,500,000,** 22 story HOTEL; **$4,000,000,** 18 story APARTMENT, DALLAS, TEX. Cary Plaza, E. H. Carey, Jr., pres. Carey-Schneider Investment Co., Medical Arts Bldg., Dallas, Tex. Harrell & Hamilton, Republic Natl. Bank Bldg., Dallas, archts.

▲ **Diamond Alkali Co.,** Deer Park, Tex., Owner Builds, Est. **$2,750,000,** POLYVINYL CHLORIDE RESIN PLANT, DEER PARK, TEX. CD 12/10/57.

▲ **Hutchinson Homes Co.,** 2360 W. 2nd Ave., Denver, Colo., Separate Contracts, **$2,800,000,** 160 RESIDENCES, Applewood West Subdivision, LAKEWOOD, COLO.

▲ **Diversified Industries of Colorado, Inc.,** 3395 S. Bannock St., Englewood, Colo., Separate Contracts, **$7,000,000,** 500 RESIDENCES, LITTLETON, COLO.

▲ **Dream Houses Acres, Inc.,** 1402 Mile High Center, Denver, Colo., Separate Contracts, **$10,500,000,** RESIDENCES, near LITTLETON, COLO.

▲ **Trend Homes,** 7753 S. Ames Way, Littleton, Colo., Owner Builds, **$12,000,000,** 600 RESIDENCES, Platte Canyon Rd., LITTLETON, COLO.

▲ **H. K. Ferguson Co.,** 1783 E. 11th St., Cleveland, O. CA Est. **$8,000,000,** OXYGEN CONVERTER for steel mill addn., PUEBLO, COLO. Colorado Fuel & Iron Corp., Continental Oil Bldg., Denver, Colo. CD 9/15.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

May 31, June 1 Alaska — June 8, 9 California

STREETS AND ROADS

May 27 Arizona - May 31 Alaska, Idaho, Washington
June 1, 8, 9, 16 California

▲† **Ariz., Yuma**—TAXIWAY REPLACEMENT, etc.—BA 5/27—Eleventh Naval Dist. P. Wks., 1220 Pacific Hy., San Diego 1, Calif., replacing taxiway, optical landing sys., Marine Corps Auxiliary Air Station, Spec. No. 24694, $1,000,000-$2,500,000. CD 10/1.

▲† **Oregon**—BA 6/7—U. S. Eng., City-County Airport, Walla Walla, Wash., grading, draining, surf., fencing for detour US Hy. 30, Watchman's Dip and U. P. R. R. shoofly, in conjunction with John Day Dam, Rufus, CIVENG-45-164-60-49, $2,500,000. Plans deposit $1.20.

HEAVY CONSTRUCTION—LB & CA

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento, Bids opened 5/11,

Calif.—**Gordon H. Ball & Gordon H. Ball, Inc.,** 300 Camille Ave., Danville, Calif., LB **$4,409,846,** (4 bidders), grading, paving to complete 7.6 mi. four and six lane freeway on US 99-50 (South Sacramento Freeway) between 0.1 mi. north of Calvin Rd. and U St. in Sacramento, incl. 3 bridges, 111-SAC-4-B, SAC, Sacramento Co.;

Calif.—**Madonna Constr. Co.,** P.O. Box 910, San Luis Obispo, Calif., LB **$1,824,159,** (4 bidders), grading, surf. to realign 12.1 mi. State Rte. 1 between 0.3 mi. north of Cayucos and 1 mi. south of Cambria, incl. bridge over Billa Creek, V-SLO-56-C, San Luis Obispo Co. CD 4/13.

▲† **George M. Brewster & Sons, Inc.,** 275 West Fort Lee Rd., Bogota, N. J., LB **$5,368,695,** est. $6,799,324, (14 bidders), earthfill main dam, six earthfill dikes and appurtenances, Black Butte Dam Project, Stony Creek, 10 mi. north of Orland, Tehama Co., Spec. 2640 ENG-04-167-60-25, CALIFORNIA. U. S. Eng., 1209 8th St., Sacramento, Calif. Bids May 10. CD 3/11.

▲† **M. M. Sundt, M. J. Bevanda & Altermatt Action Ventures,** P.O. Box 439, North Hollywood, Calif., LB **$4,451,113,** est. $5,073,200, (10 bidders), constr. roads, utilities, Naval Missile Facility, Point Arguello, Spec. 24954, POINT MUGU, CALIF. Dist. P. Wks. Office, 11th Naval Dist., 1220 Pacific Hy., San Diego 1, Calif. Koebig & Koebig, 3242 West 8th St., Los Angeles, Calif., engrs. Bids May 10. CD 4/12.

BUILDINGS—LB & CA

▲ **Dickman Constr., Inc.,** 1702 Miramonte Ave., Mt. View, Calif., LB **$2,263,600** (9 bidders), wood, steel frame Blackford HIGH SCHOOL No. 4, CAMPBELL, CALIF. Campbell Union High School Dist., 151 N. Winchester Rd., Campbell, Calif. Bids May 5. CD 4/8.

▲ **B. L. Metcalf Co.,** 1460 N. Glassell Ave., Orange, Calif., CA **$2,949,000,** (13 bidders), TRADES & FOODS BLDGS., Trade Technical Junior College, 400 W. Washington Blvd., LOS ANGELES, CALIF. Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. Kistner, Wright & Wright, 1125 W. 6th St., Los Angeles, Calif., archts. Bids Apr. 19. CD 4/12.

▲ **E. E. Black, Ltd.,** 1067 Kawalahao St., Honolulu, Hawaii, CA **$3,963,000,** (5 bidders), 18 story OFFICE and GARAGE, HONOLULU, HAWAII. Bishop National Bank, 161 S. King St., Honolulu, Hawaii. Bids May 11. CD 4/12.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS

May 26 Newfoundland — June 8 Ontario

BUILDINGS—BA

▲ **Man., Winnipeg**—REHABILITATION CENTRE—BA 5/25—Sanatorium Bd. of Manitoba, 668 Bannatyne Ave., 6 story rehabilitation centre, vicinity Winnipeg General Hospital, $4,000,000. Plans deposit $100. Extended date. Moody, Moore & Partners, 295 Broadway, archts. CD 4/27.

HEAVY CONSTRUCTION—LB & CA

▲ **Raymond Concrete Pile Co. Ltd.,** 1900 Yonge St., Toronto, Ont., LB **$2,498,543,** (13 bidders), Stage 3, Lakehead Harbor imprvs., incl. wharf constr., reclamation and dredging, PORT ARTHUR, ONT. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Bids May 5. CD 3/30.

▲ **Orsini Constr. Ltd.,** 363 Rogers Rd., Toronto, Ont., LB **$3,116,874,** (8 bidders), rein.-con., structural steel structure from Station 218/93.64 to Station 237/18.60 Strachan Ave., Frederick G. Gardiner Expressway (Contract R 3-60), TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. E., Toronto, Ont. Bids May 6. CD 4/29.

▲ **QUEBEC**—Dpt. P. Wks., Parliament Bldgs., Quebec City,

Quemont Constr. Ltee, 6655 Cote des Niege Rd., Montreal, Que. CA Est. **$2,500,000,** bridge over St. Maurice River, Shawinigan. Awarded May 4. CD 2/13/59.

BUILDINGS—LB & CA

▲ **Turnbull & Gales Constr. Co. Ltd.,** 1540 W. 2nd Ave., Vancouver, B. C., CA **$2,204,889,** rein.-con. Windermere Secondary SCHOOL, incl. 27 classrooms, five shops, one triple gymnasium, auditorium, cafeteria and administrative offices, VANCOUVER, B. C. Vancouver School Bd., 1595 W. 10th Ave., Vancouver, B. C. Bids Apr. 26. CD 5/6, under LB.

▲ **E. G. M. Cape & Co. (1956) Ltd.,** 4898 Western Ave., Montreal, Que., LB $3,028,700, (7 bidders), 5 story, 164x234 ft., rein.-con., granite walls POST OFFICE, QUEBEC CITY, QUE. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Bids May 4. CD 3/8.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲ **George Wimpey & Co., Inc.,** London, England, CA Est. **$2,250,000,** second stage, Salaverry Port imprvs. incl. pier, 2 warehouses, railroads, lighting, PERU. Government of Peru, Lima, Peru.

U. S. POSSESSIONS

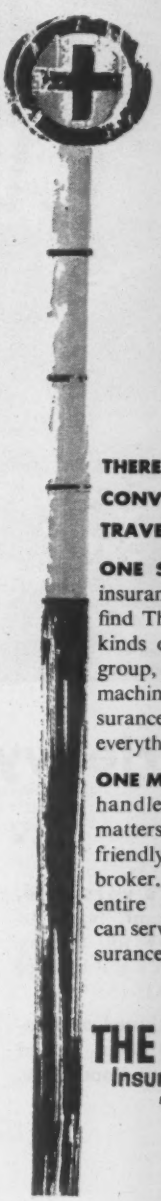
HEAVY CONSTRUCTION—BA

▲† **Canal Zone, Balboa**—AIR ROUTE TRAFFIC CONTROL—BA 6/27—Federal Aviation Agency, Region 2, P. O. Box 1689, Fort Worth, Tex., U. S. A., air route traffic control center, international flight service station, IFB 2-60-284. Plans deposit $50. CD 2/10.

FOREIGN

BUILDINGS—LB & CA

▲ **M. J. Gleeson,** North Cheam, Surrey, England, CA Total project **$56,000,000,** ATOMIC ENERGY LABORATORY for intermediate current stability experiments, Oxfordshire, CULHAM, ENGLAND. United Kingdom Atomic Energy Authority, Culham, England.



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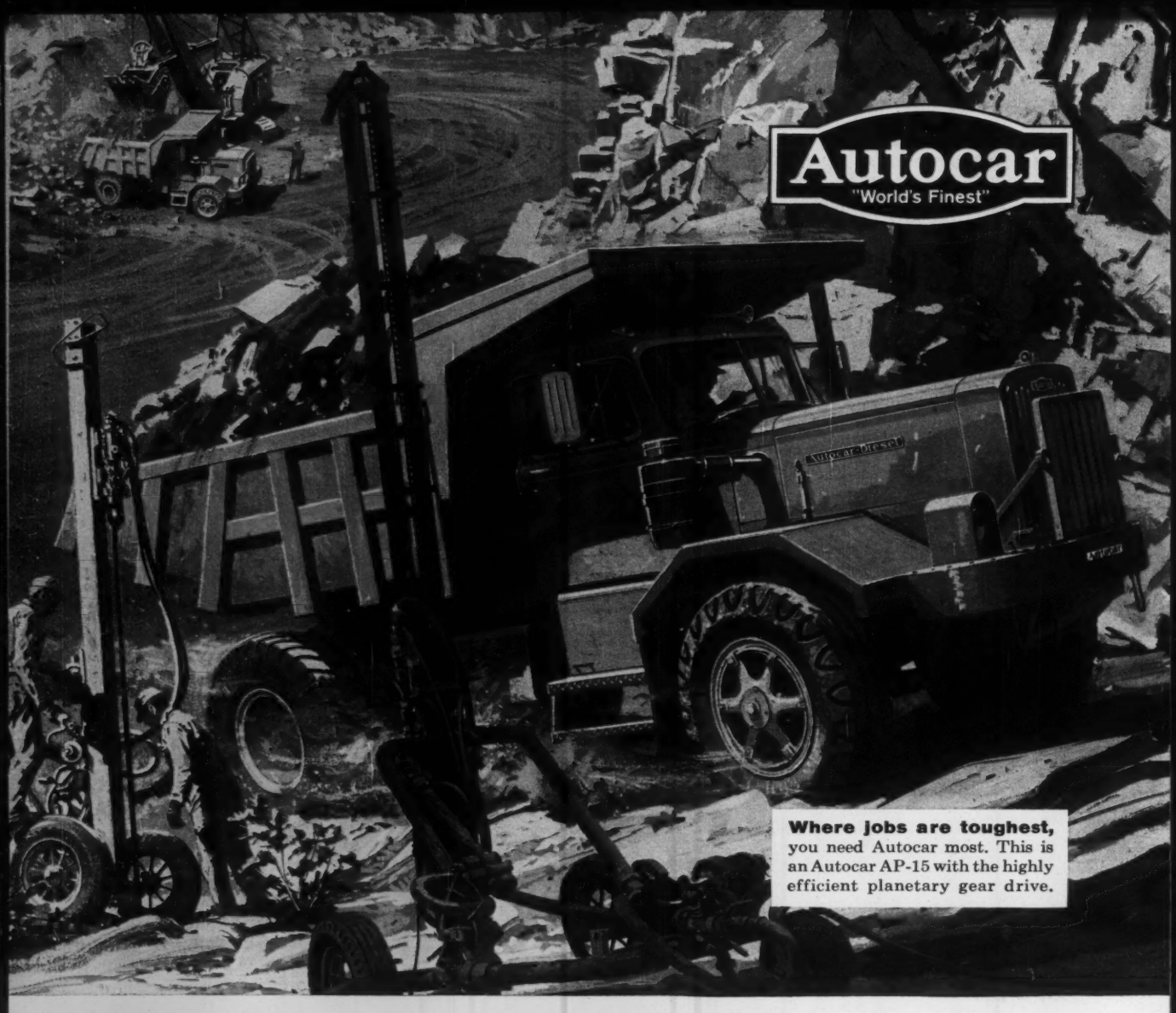

Where jobs are toughest, you need Autocar most. This is an Autocar AP-15 with the highly efficient planetary gear drive.

"Heavy hauling's for Autocar . . . not a substitute"

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This Autocar is at home on slippery shale rock; in deep, rutted mud; up grades that look impossible. That's because—with its planetary rear axle—the power is applied with greater gear reduction directly to the rim of the wheel.

Here's a truck plenty tough for anything that comes. It is constructed throughout—from bolted double frame to double-bottom body—to take the heavy shocks and jolts of the day's work.

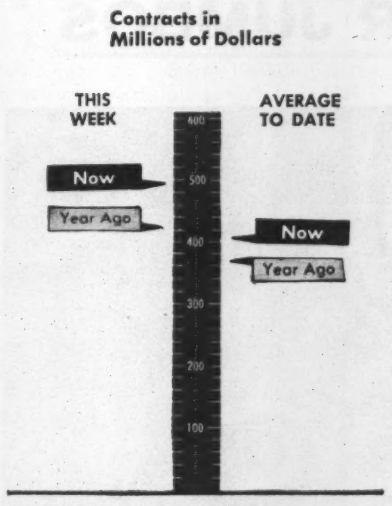
Each Autocar is custom-engineered to order. Operators agree, Autocar is the "World's Finest." Why try to get along with less? White-Autocar comprehensive service throughout the United States.

Autocar
"World's Finest"

Division of
The White Motor Company
Exton, Pa.

Construction Scoreboard

This Week...



AMOUNT OF CONTRACTS LET

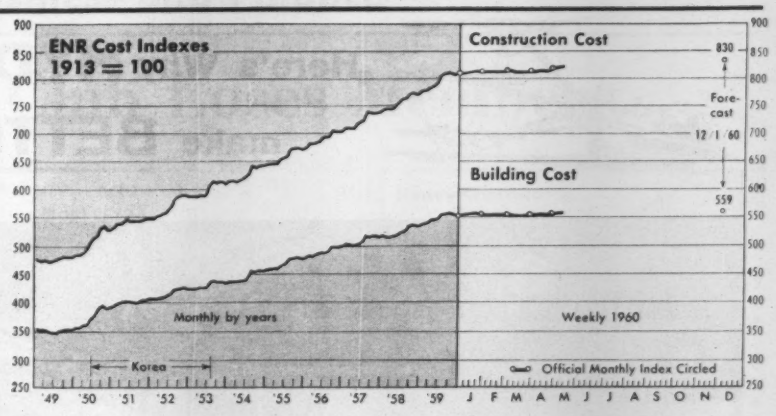
Contracts Awarded In 50 States By Type	This Week millions	Cum. 20 wks 1960	Chge '59-'60 %
All Heavy Construction	$498.0	$8,008.2	+10
By Ownership			
PRIVATE	289.2	4,356.0	+24
PUBLIC	208.8	3,732.2	− 4
State & Municipal	178.2	2,861.6	+ 4
Federal	30.6	870.6	−23
By Type of Work			
PUBLIC			
Waterworks	11.0	177.7	+ 8
Sewerage	10.1	204.5	−13
Bridges*	9.0	346.4	+53
Highways	72.4	1,146.1	+ 3
Earthwork, Dams & Waterways	6.6	265.5	−14
Buildings:			
Excl. Housing	65.7	887.4	− 9
Housing	21.7	202.8	−21
Unclassified	12.5	503.1	−15
PRIVATE			
Buildings:			
Mass Housing	145.4	2,164.7	+41
Commercial	60.1	814.8	− 4
Industrial	75.4	1,000.1	+ 4
Unclassified	8.1	375.1	+140

*Includes Private bridges

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

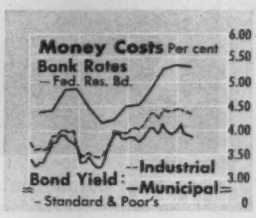
NEW CONSTRUCTION CAPITAL

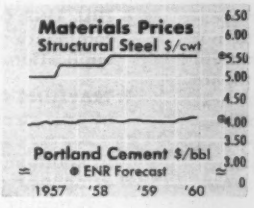
	Week of May 12 millions	Cum. 19 wks 1960	Chge '59-'60 %
Corporate Securities	$ 29.0	$1,026.9	−23
State and Municipal:			
All Except Housing	150.2	2,535.7	− 1
Housing	....	13.6	−56
Federal Loans	2.2	62.8	+15
Federal Aid	....	2,717.8	....
Total Nonfederal	$181.4	$6,356.9	+60
Federal Appropriations:			
Projects in U. S.	162.9	168.1	....
Outside U. S.	....	6.8	....
Total New Capital	$344.3	$6,531.8	+63

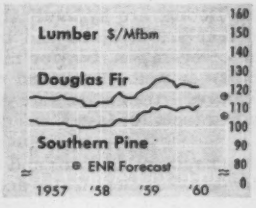


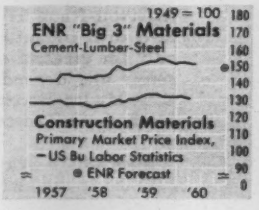
ENR INDEXES (1913=100), 20-cities' average	Week of May 12 1960	% Change from Apr. 14 1960	% Change from May 14 1959
Construction Cost	822.20	+0.8	+3.4
Building Cost	558.36	+0.3	+2.1

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.





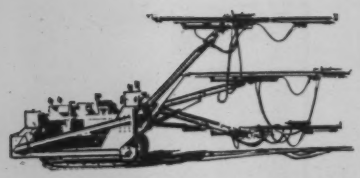




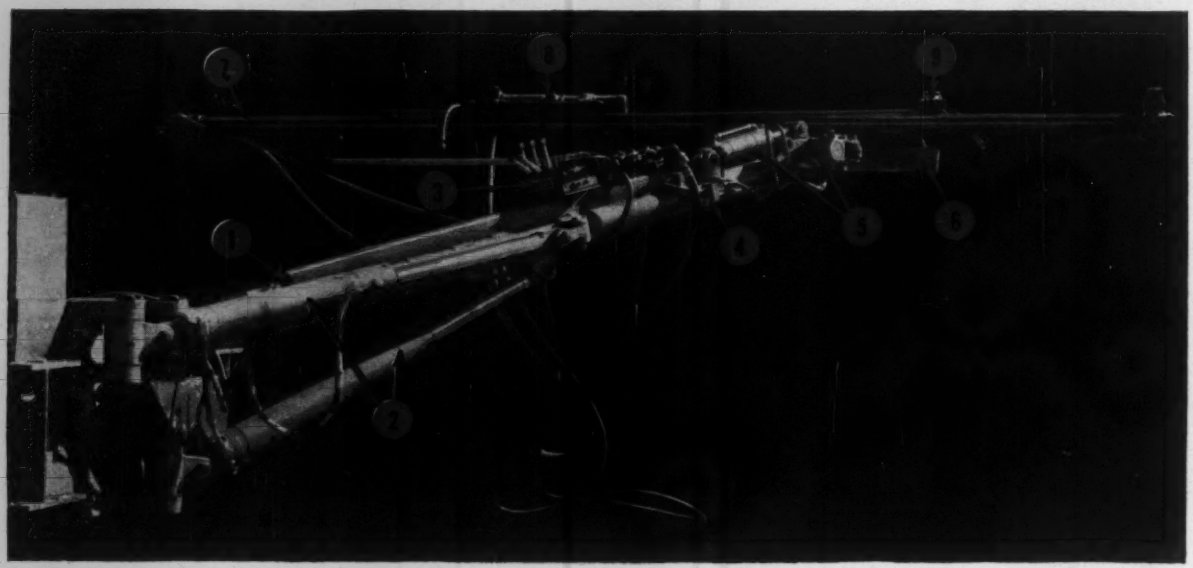
This Month . . .

ENR COST INDEXES IN 22 CITIES, 1913 = 100

City	Construction Cost May 1960	Construction Cost Percent Change from last Month	Construction Cost Percent Change from last Year	Building Cost May 1960	Building Cost Percent Change from last Month	Building Cost Percent Change from last Year
Atlanta	633.26	0	+6.5	497.72	0	+4.1
Baltimore	754.72	0	+6.0	554.82	0	+1.8
Birmingham	653.77	+0.2	+4.6	517.68	+0.2	+3.8
Boston	841.37	+1.0	+1.3	565.37	+0.1	+1.6
Chicago	920.88	+0.2	+5.5	583.77	+0.4	+1.3
Cincinnati	814.79	−0.2	+3.0	540.31	−0.3	+2.0
Cleveland	944.49	+2.6	+3.3	561.64	+1.4	+3.1
Dallas	629.06	+4.1	+9.7	519.19	+5.0	+9.4
Denver	752.96	−0.9	+1.3	539.37	−1.0	+2.0
Detroit	962.74	0	+7.0	598.96	0	+2.9
Kansas City	798.46	0	+0.6	556.01	+0.6	+1.4
Los Angeles	870.38	0	+3.6	561.17	+0.9	+2.5
Minneapolis	860.16	0	+0.5	569.61	0	+0.8
New Orleans	644.46	0	+3.8	514.34	0	+3.6
New York	1010.58	0	+3.9	645.06	0	+1.8
Philadelphia	825.37	+4.4	+2.6	582.90	+0.9	−0.2
Pittsburgh	857.54	0	+2.0	608.70	0	+2.2
St. Louis	881.98	+0.2	+0.1	581.05	+0.4	+0.1
San Francisco	886.07	+4.3	+7.5	549.39	+0.2	+0.7
Seattle	859.42	0	+2.9	505.90	0	+2.4
U S.—20 Cities' avg.	820.18	+0.8	+3.7	557.66	+0.4	+2.3
Montreal	650.39	+3.1	+6.5	466.08	+1.0	+3.5
Toronto	697.39	+4.8	+7.3	497.28	+2.0	+0.8



Here's Why HYDRA-BOOMS make BETTER JUMBOS



Ingersoll-Rand Hydra-Booms are hydraulically-operated drill mountings that are designed and built not only for greatest ease of operation, but for maximum *safety* and *dependability* as well. Check and compare these Hydra-Boom features — then make sure your next jumbo has all these advantages for faster, safer drilling.

1. **HOSE SHIELD** welded to boom, protects air and hydraulic hoses against damage. Simpler, neater and safer.

2. **SAFETY-LOCK CYLINDERS** — big, powerful, double-acting for fast operation in either direction. Safety-lock check valves prevent creeping or dropping of booms.

3. **BOOM-MOUNTED OR REMOTE CONTROLS** — can be mounted wherever desired. For fully centralized operation, they can be combined with remote drill controls.

4. **HYDRAULIC JUNCTION BOXES** — short hydraulic connections from end of boom simplify replacement in case of wear or damage.

5. **POWER DUMP & SWING** — separate cylinders move drill guide to any position at the touch of a control valve.

6. **PROTECTIVE SHIELD** over end of drill-feed extension cylinder prevents damage to the hydraulic connection—otherwise a vulnerable spot.

7. **SCREW OR CHAIN FEEDS** — Ingersoll-Rand can supply reversible aluminum-shell screw feeds from 30" to 144", as well as air-driven chain feeds to any practical length.

8. **FULL LINE OF HEAVY-DUTY DRIFTERS** — with the right combination of weight, power and bore size for any application.

9. **TRAVELING CENTRALIZER** prevents whipping and fatigue of drill steels, assuring substantially longer rod life.

In addition, Ingersoll-Rand has pioneered in the development of the following equipment for tunneling and mining jumbos and can meet your exact requirements for any job.

BURN-CUT "PACKAGE" — Ingersoll-Rand Downhole Drill, air-powered rotary head, chain feed and large-diameter Carset bit for drilling a central burn cut. Permits pulling longer rounds and gives improved fragmentation with less powder.

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A CONSTANT STANDARD OF QUALITY IN EVERYTHING YOU NEED FOR DRILLING ROCK

$100,000-Plus Club Loses Members

New business of $100,000 or more went into the account books of 9,984 heavy construction contractors in 1959. The count is 1% under 1958's record of 10,052 contractors who took on $100,000 or more in new business.

The decline is largely a reflection of last year's cutback in federal-aid highway and bridge contract awards (see table below). The figures are based on ENR's analysis of its contract award reports.

But the number of building contractors who won $100,000 or more in 1959 set a new record—3,936. That's a jump of 7% over the number getting $100,000 or more in building contracts during 1958. The jump stems largely from 1959's sharp rebound in industrial building, a hefty gain in mass housing and a record year for commercial buildings, a sector sparked by a demand for shopping centers and stores.

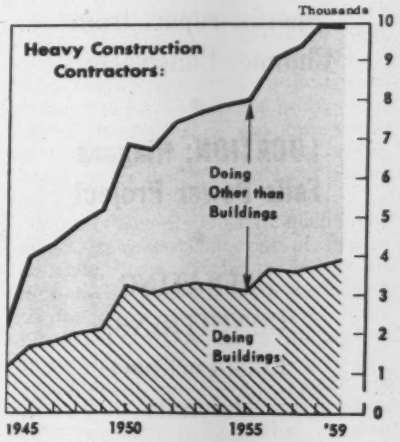
The number of contractors doing other than buildings dipped 5% last year, to 6,048 from the 1958 total of 6,388. Sharpest decline in this general category occurred in the bridges and highways and streets groups. The number of contractors taking on $100,000 or more in new business for bridge construction dropped 28% from 1958—811 compared to 1,122. Highways and streets contractors declined 11% to 2,805, from 1958's total of 3,151.

Contractors winning $100,000 or more in airports contracts dropped 12% in 1959 from a 1958 total of 1,044. And those working in the unclassified sector dropped 16% from 1,022 in 1958 to 857 in 1959. Unclassified includes federal, state and municipal, private ownership, consisting of such work as airports, missile bases, gas pipelines, and water lines.

Despite the drop in the number of $100,000-or-more contractors in highways, this type of work still attracted more companies in 1959 than any other area of construction.

The number of contractors in types of work other than buildings, however, increased in 1959: Waterworks, up 16% to 678; sewerage, up 5% to 1,190; and earthwork and waterways, up 12% to 765.

Last year's decline in the number of contractors doing $100,000 or more annually in heavy construction was the first since 1951. It should prove temporary. Big increases in highway and bridge contracts, plus anticipated gains in other categories, will probably push the 1960 count to a new all-time high.



In the buildings category, the number of contractors in industrial work who won $100,000 or more in new business rose 41% from 1958, to 1,481.

Housing contractors taking on $100,000 or more in new 1959 business soared 76%, to 907 from 1958's total of 514. The number of contractors building shopping centers and stores rose 43% from 1958's tally of 192.

Contractors whose new business volume in 1959 hit $1 million or more dipped only 2% from 1958.

Contractors' New Business in 1959 by Volume

	All Contractors Doing $100,000 or More			Contractors With $1,000,000 or More			Contractors With $500,000–$1,000,000			Contractors With $100,000–$500,000		
Type of Work	1959	1958	% Change '58-'59	1959	1958	% Change '58-'59	1959	1958	% Change '58-'59	1959	1958	% Change '58-'59
TOTAL	9,984	10,052	− 1	3,489	3,559	− 2	2,029	2,046	− 1	4,466	4,447	+ 0.4
OTHER THAN BULDINGS	6,048	6,388	− 5	1,776	2,053	−13	1,104	1,174	− 6	3,168	3,161	+ 0.2
Waterworks	678	587	+16	246	190	+29	130	109	+19	302	288	+ 5
Sewerage	1,190	1,136	+ 5	357	377	− 5	237	202	+17	596	557	+ 7
Bridges	811	1,122	−28	394	653	−40	148	169	−12	269	300	−10
Highways and streets	2,805	3,151	−11	1,032	1,289	−20	536	631	−15	1,235	1,231	+ 0.3
Earthwork & waterways	765	685	+12	370	350	+ 6	124	102	+22	271	233	+16
Airports	914	1,044	−12	429	473	− 9	145	165	−12	370	406	−16
Unclassified	857	1,022	−16	290	379	−23	122	147	−17	445	496	−10
Federal (included above)	1,420	1,637	−13	603	666	− 9	246	248	− 1	571	723	−21
BUILDINGS	3,936	3,664	+ 7	1,713	1,506	+14	925	872	+ 6	1,298	1,286	+ 1
Industrial	1,481	1,050	+41	616	446	+38	207	174	+19	658	430	+53
Mass housing, commercial and public	2,990	3,057	− 2	1,535	1,385	+11	811	791	+ 3	644	881	−27
Housing	907	514	+76	507	126	+302	237	195	+22	163	193	−12
Schools	995	1,143	−13	558	565	− 1	290	309	− 6	147	269	−45
Offices, private	189	228	−17	149	148	+ 1	30	47	−36	10	33	−70
Offices, public	99	116	−15	56	79	−29	26	18	+44	17	19	−11
Shopping centers, stores	275	192	+43	187	110	+70	55	49	+12	33	33	0
Public industrial, military and atomic energy	243	353	−31	102	134	−24	40	59	−32	101	160	−37
Other building: private	457	460	− 1	280	257	+ 9	89	100	−11	88	103	−15
Other building: public	353	272	+30	204	157	+30	78	56	+39	71	59	+20
Federal (included above)	370	478	−23	223	294	−24	62	58	+ 7	85	126	−33

ENR Data

"WE CHOSE TIMKEN® CARBIDE INSERT BITS FOR CONSISTENT PERFORMANCE"

Special report from Channel Constructors

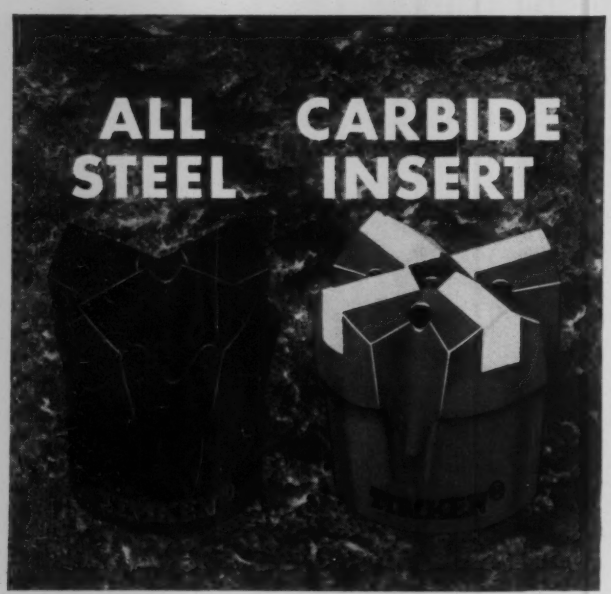
•

LOCATION: Niagara Falls Power Project

•

OPERATING CONDITIONS: Rock-Lockport Dolomite

Reports from the Niagara Power Project prove again that Timken® carbide insert bits give the most economical service. Timken bits were used in drilling the 500 ft. wide, 100 ft. deep cut shown at the right. Channel Constructors chose Timken carbide insert bits because of their consistent performance on the rock drilling phase of this project. Users of Timken bits everywhere report such savings—more feet-per-bit, longer bit life, fewer lost holes.



Which Timken Bit should you use?

Your most economical bit for hard, abrasive ground is the Timken carbide insert bit. In softer ground, use the low-cost Timken all-steel multi-use bit. Because both bits are interchangeable in the same thread series you can switch bits when the ground changes. Dozens of different Timken bits fit the same drill steel. Both types are made from Timken electric furnace fine alloy steel, have special shoulder unions that protect threads against drilling impact. Let us help you select the Timken bit that will do the most economical job for you. The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits.*

TIMKEN®
removable rock bits

Failures in First Four Months—Type and Size

Reported by Dun & Bradstreet, Inc.

	Number		%	Liabilities (add ,000)		%
	1960	1959	Chg.	1960	1959	Chg.
U.S. TOTAL	849	703	+21	$55,851	$35,397	+58
By Type of Contractor						
General building contractors	317	239	+33	28,075	17,815	+58
Building subcontractors	476	402	+18	23,495	14,084	+67
Other contractors	56	62	−10	4,281	3,498	+22
By Size of Liability						
Under $25,000	398	362	+10	4,319	3,876	+11
$25,000—$99,999	301	265	+14	14,318	11,949	+20
$100,000 and over	150	76	+97	37,214	19,572	+90

Contractor Failures on the Rise...

Contractor failures during the first four months of this year remained at the highest levels in a quarter century.

According to Dun & Bradstreet, Inc., there were 21% more bankruptcies in the period ending April 30 than in the same period of 1959. Liabilities of the 849 failures so far this year are 58% higher than the debits of those who flopped in last year's first four months—$55.9 million compared with $35.4 million.

General building contractors and their subcontractors are particularly hard hit: So far this year, 317 general building contractors have failed as against 239 in last year's first four months; among their subcontractors there are 476 flops this year against 402 for the same period last year. Liabilities for the building contractors are up 58% ($28.1 million to $17.8 million); and for their subs, 67% ($23.5 million to $14.1 million).

Among "Other Contractors" (mostly heavy construction) the mortality rate is down 10%, 56 this year to 62 last year. But those who failed this year are deeper in the red, with liabilities of $4.3 million, 22% more than the total owings of last year's dropouts.

So far this year 150 failures have liabilities of more than $100,000. Last year at this time there were only 76 who flopped that much in the red. But there are 10% more failures with liabilities under $25,000 and 14% more failures owing between $25,000 and $99,999.

The climbing rate of failures clearly spells out the intensity of competition and the huge increase in contracting capacity lying idle because work is not available.

To stay out of the bankruptcy courts, contractors will have to keep a sharp watch on their bidding and accounting practices, the amount of work they take on in relation to capital, and their equipment outlays.

. . . British Builders Also Pinched

Severe competition is squeezing some of Britain's civil engineering and contracting companies, according to reports by two construction industry organizations.

In its annual report, the Federation of Civil Engineering Contractors says there is "a serious shortage of work, particularly of medium- and small-sized schemes for local authorities."

And the chairman of the British Taylor Woodrow group of building and civil engineering companies told stockholders that "international competition is very severe for contracts overseas and many of the conditions of contract are most unfair—and indeed, disastrous."

The executive, Frank Taylor, said that foreign employers are asking for longer periods of credit and lower and lower interest rates. "There is at the moment, in various parts of the world, a battle to see who can lend the most money on contracts and carry out the work regardless of fiancial losses incurred."

British competition, already intense, became worse as a result of recent government credit restrictions, Mr. Taylor warned. They might reduce the volume of work available, he said. He also charged that some firms are taking jobs below cost. "In every case where bids are opened, it appears that one or two contractors are going in at figures well below cost," he said.

This charge was echoed by Maurice Laing, chairman of the Federation of Civil Engineering Contractors. "It is surely better for each of us to do less work and avoid losses than to weaken ourselves by accepting contracts at a loss," he declared.

State's Bridge Replacement Costs Set at $250 Million

The Pennsylvania Department of Highways has started a bridge replacement program that could result in expenditures of an estimated $250 million over the next 12 years.

Park H. Martin, secretary of highways, says the department recently hired engineering firms to design replacements for 53 existing bridges considered hazardous. This brings the total number of replacement bridges placed under design since last October to 212.

More than 4,400 state-maintained bridges, or about one out of five in the state, have weight or height restrictions. Thousands more are hazardous for other reasons, such as blind approaches or too-narrow width, according to Mr. Martin.

Assignment of bridge design to private firms started late last year when the department realized that its own limited forces could not turn out plans fast enough to meet the needs of the replacement program.

The bridge replacement program is in addition to the highway department's regular highway and bridge improvement work.

Last year, 118 bridges considered hazardous were replaced. So far this year, bid invitations have been advertised for 80 bridge replacements.

The program was initiated in 1958 after a posted bridge collapsed just as a loaded school bus cleared the structure.

Rhode Island Set to Vote On $200-Million Road Plan

Fate of a proposal to put Rhode Island's highway construction program on a crash basis will be decided next week at a special referendum that will be presented to the voters on a $200-million borrowing program.

Proposed enabling laws call for the sale of bonds in anticipation of reimbursement by the federal government on all types of federally aided road construction. Goal of the legislation is completion of the state's Interstate program in seven years instead of 14 years, as originally planned.

The road system would include construction of a circumferential route around Providence to link the East Providence Expressway and the Providence River Bridge. Other routes would extend the Interstate to the Connecticut line.

The legislature rejected a proposal to construct an east-west tollroad across the state from Connecticuit to Massachusetts.

SAUERMAN NEWS briefs

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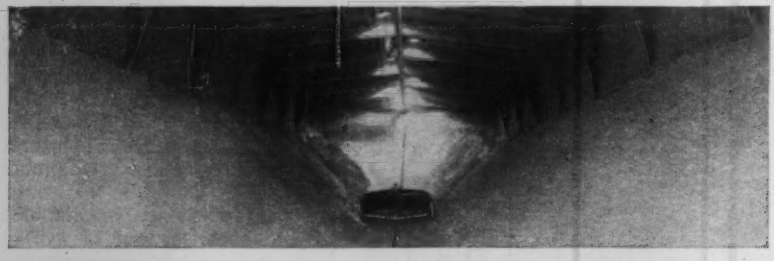


Self-Unloading Vessels

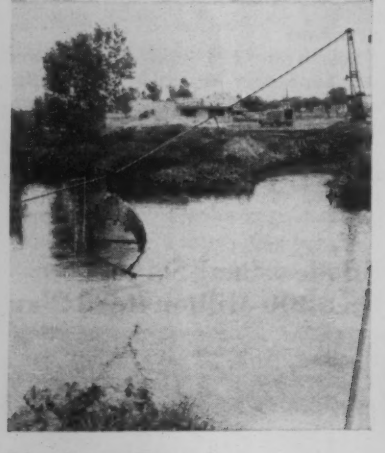
Sauerman DragScrapers provide efficient clean-up and low-cost cargo unloading capacities from 100 tph. (or less) to over 2000 tph. They are a component part of many ship unloading installations.

The systems are designed to suit the requirements of a particular vessel and are being incorporated in the construction of new self-unloaders as well as in the conversion of existing vessels.

DragScraper unloading allows maximum space for cargo stowage. The cargo rides low in the hold providing greater stability and increased carrying capacity over cargoes which are hoppered high.

Sauerman ship unloaders are economically handling rock, ore, sand, coal and cement. One man controls the entire operation from a convenient station overlooking the hold and away from any hazards of material or working area.

(Condensed from Marine Brochure MB-1)



Digging a Trench Under Water

Digging a trench across the Big Calumet River was economically handled by a ¾-yd. Crescent DragScraper used with a ½-yd. crane. The crane's hoisting line was used as a track cable for the DragScraper and single wheel carrier. This cable was dead-ended on the opposite shore.

To permit gravity return of the DragScraper, the crane was placed upon a built-up mound of dirt and the boom raised to its highest point. Spooling capacity of the crane's load drum was just enough to allow the DragScraper to dig the trench the width of the river. Depth of the trench was about 6 ft. at an average depth of 12 ft. below water.

(Condensed from Sauerman News No. 151)

Handling Phosphate Ore

Ore concentrate is stockpiled and reclaimed as required to the foot of a bucket elevator by a Sauerman DragScraper Machine at a Southern chemical plant.

A self-propelled tail tower travels around the perimeter of the stockpile. The tower is shifted to change the line of operation. DragScraper haul length is 400 ft. The operator's station for the Sauerman hoist is located above the conveyors to give a clear view of the pile.

(Condensed from Sauerman News No. 151)

MORE NEWS AND INFORMATION

Issues of Sauerman News giving greater detail about the installations on this page are available on request. For full information, tell us your interest or requirements and ask for catalog. Contact Sauerman Bros., Inc., 632 S. 28th Ave., Bellwood, Ill.

In Brief . . .

• **Construction company earnings**—Tishman Realty & Construction Co., Inc., New York City, reported net income after taxes of $792,000 for the first six months of its 1960 fiscal year. This compares to after-tax net of $2.8 million in the same period of 1959. Norman Tishman, president, says, however, that earnings for the full year will be comparable to those of 1959.

• **School bond referendum**—Voters of Jefferson County, Colo., near Denver, will act June 1 on a $11.6-million school bond proposal. All of the funds would go for construction.

• **Housing program for '60**—New York City will spend $230 million for construction of 15 public housing developments. Contracts for projects will be awarded at a rate of one every two weeks until the end of October. The developments will provide 12,481 apartment units. Projects will be built in one or two phases. Contracts let this year will provide for 8,765 apartment units.

• **Construction bonds due**—Denver will sell $11.8 million worth of revenue bonds May 25 to finance improvements at the municipal airport, Stapleton Field. Major construction projects will include a new north-south jet runway, and resurfacing and extension of taxiways.

• **Steel mill planned**—Lone Star Steel Co., Jacksonville, Tex., will build a Strategic-UDY process steel plant in the East Texas South Basin area. No site has been decided on yet.

• **Bid call for runway**—San Francisco Public Utilities Commission has called for bids on a $1.9-million runway extension project at San Francisco International Airport. Bids will be opened May 26 in San Francisco. Job calls for 2.5 million cu yd of fill for 600-ft jet runway extension.

• **Contract coming**—Contract award for construction of the $19-million Brookville Chemicals Ltd. plant at Maitland, Ontario is due soon. Some equipment contracts have already been let.

• **Rubber plant for California**—Armstrong Rubber Co., West Haven, Conn. will build a $25-million tire manufacturing plant at Hanford, Calif.

Rust-Oleum is distinctive as your own fingerprint. Accept no substitute.

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ONE MAN often does the work of two!

Easier to use—because Rust-Oleum 769 Damp-Proof Red Primer goes directly over sound rusted metal after scraping and wirebrushing to remove rust scale and loose rust—usually eliminating costly surface preparations. *Stops Rust*—because the *specially-processed* fish oil vehicle in the 769 Primer penetrates rust to bare metal—helping to drive out air and moisture that cause rust. And it's easily applied by brush, spray, or roller.

Beautifies as it protects—because the Rust-Oleum New Color Horizons System of primers and top coats includes a wide array of smart new colors that resist moisture, fumes, humidity, weathering, etc. Talk to your Chief Engineer—try Rust-Oleum on your tanks, fences, metal sash, roofs, structural steel. See how it lasts and lasts. Consult your Rust-Oleum Industrial Distributor, or write for the New Color Horizons catalog—38 pages, free!

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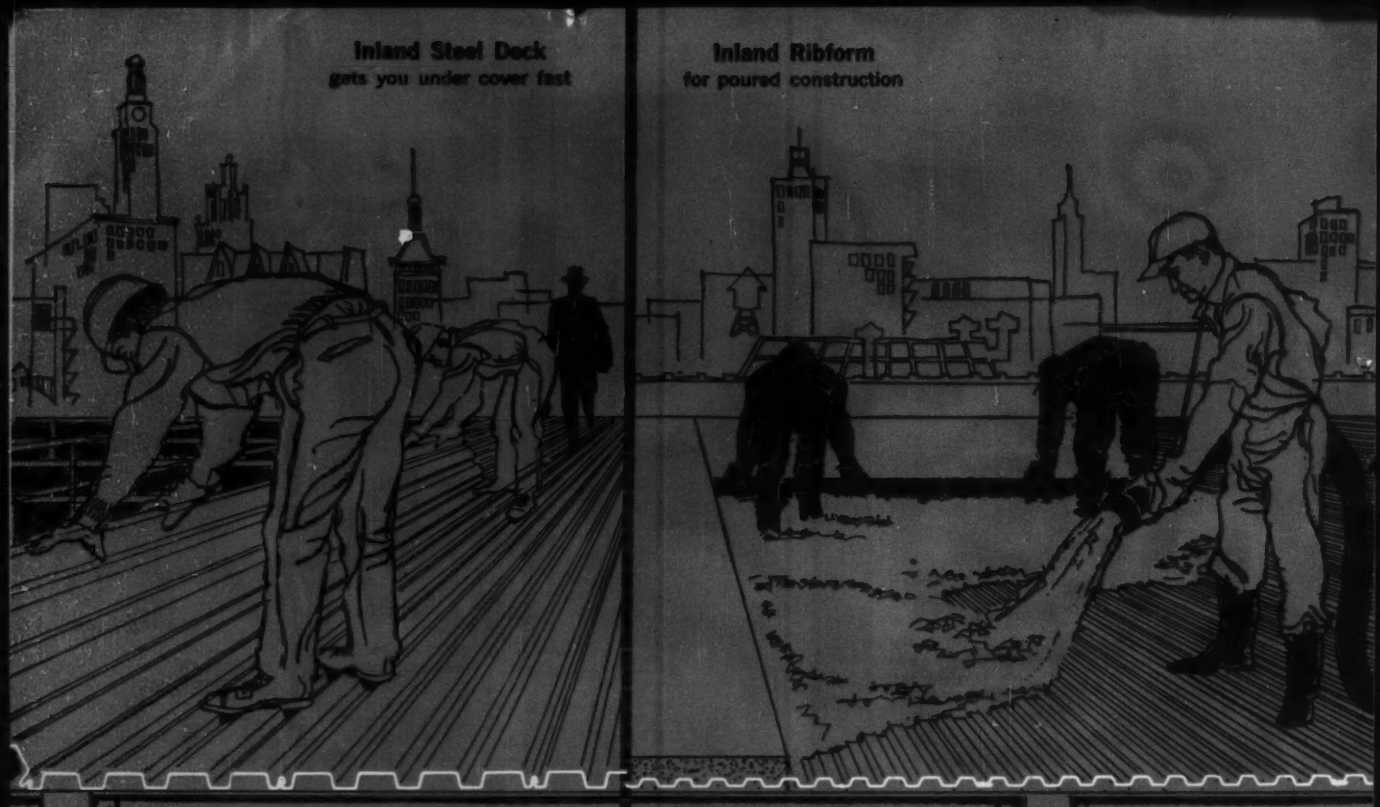
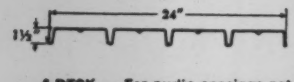
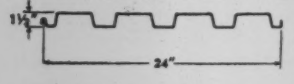


Steel deck or centering...you name it, INLAND has it!



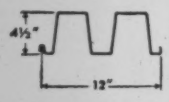
A-DECK — For purlin spacings not exceeding 8'4". Narrow ribs provide deck surface that supports the thinnest or softest types of insulation.

H-DECK — New! For simple spans to 20'0" — 3" and 4½" depths. Especially practical to cover walkways in shopping centers, schools, other installations.

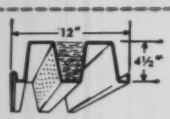


B-DECK — For spans to 10'0". Wide rib distributes metal for greater structural efficiency. Well suited for use as side wall panels.

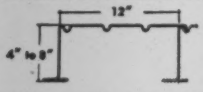
B-ACOUSTIDECK — Two-in-one panel combines steel roof deck with acoustical ceiling having Noise-Reduction Coefficient of .70. Used for spans to 10'0".



C-DECK—Carries normal roof loads over spans up to 24'0". Used extensively in canopies.



C-ACOUSTIDECK — Offers same Noise-Reduction Coefficient as B-Acoustideck. Can be used for spans to 24'0".



T-STEEL — New! Galvanized only. For clear spans to 32'0". Adaptable to acoustical and flush, luminous ceiling treatments. Provides superior diaphragm to resist seismic and wind loads.

RIBFORM — High-tensile, galvanized steel form for concrete slabs over spans up to 8'0". Three types: Standard, Heavy-Duty, Super-Duty (shown).

Expansion projects and new buildings get under cover fast and economically, when you specify an Inland roof system.

Inland steel deck is easy to handle and weld in place — in any weather that a man can work. Effects of construction abuse are held to a minimum, since types A, B, C, and H decks are Bonderized, then covered with a baked-enamel primer that resists on-the-job damage. One field coat of paint over this is usually enough.

In concrete-over-steel construction, Inland Ribform supports wet concrete with minimum deflection. Rigid sheets are quickly and inexpensively attached to supports — in place, they provide a safe work platform for crews.

Write for catalogs 240, 241, and 245 — see Sweet's sections 2c/Inl, 11a/In, and 2a/In. For help on unusual problems, you can draw on the diversified experience of Inland sales engineers. Write or call your nearest Inland office.

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House Report Clarifies Picketing Bill

- **Labor committee majority replies to the strong opposition coming from some employer groups.**
- **Bill would not affect manufacturers, nor legalize product boycotts, closed shops.**

A majority of the members of the House Education and Labor Committee has taken to task those who have opposed the construction industry's controversial and warmly debated situs picketing bill.

Nineteen members of the committee say the bill has been widely misinterpreted. They contend it is clear, concise and very restricted in scope.

The bill applies only to construction site labor disputes, affects only construction industry employers, would not legalize product boycotts and would not restore the closed shop. So contends the committee's majority in its report on the bill.

The report represents the first authoritative explanation of what the bill is and what it would do. It forms part of the legislative history to which the courts will turn in interpreting the provisions if they become law.

The bill is commonly referred to as the Thompson bill, H.R. 9070. It simply states that the secondary boycott provisions of the federal labor law shall not be so construed as to prevent a strike against one of several construction industry employers working at the same site, as long as these three conditions are met: There is a labor dispute with one of the employers; the dispute is over wages, hours or working conditions of employees at the site; and the dispute or strike is not unlawful under other sections of the law.

Avowed purpose of the bill is to give construction workers strike rights equal to those Congress has given factory workers. Argument is that the Supreme Court destroyed this equality when it ruled in the Denver Building Trades case that a strike that seeks to shut down the work of all contractors at a construction site is automatically a secondary boycott.

The bill has been favorably reported and is before the Rules Committee.

Opponents of the bill, including six committee dissenters, refer to it as a dangerously vague and sweeping grant of power to labor bosses that are already too powerful. They say it would open a Pandora's box of labor problems, extend disputes beyond construction sites, block the introduction of new materials and techniques, increase costs and restore the closed shop.

Committee members who approved the bill vigorously disagree. They categorically state that:

- The bill does not lift the Landrum-Griffin restrictions on organizational or recognition picketing.
- It does not validate the closed shop.
- It relates only to strikes or labor disputes directed at employers engaged primarily in the construction industry. It does not affect employers primarily engaged in some other industry, such as manufacturing. It does not reach beyond the construction industry.
- It does not change the law on product boycotts. These would remain illegal.
- It does not legalize strikes unlawful under other sections of the law, such as jurisdictional strikes.
- It does not upset the "separate gate" line of cases that insulate outside contractors doing industrial construction work from in-plant labor disputes.
- It does not change the Landrum-Griffin law on hot-cargo agreements. It does not allow picketing to enforce such agreements, even if the agreements are valid under the Landrum-Griffin law.
- It does not upset the Moore-Drydock doctrine that imposes restrictions on picketing where the basic dispute occurs in a work area containing a truly neutral employer. That doctrine would still protect non-construction employers at a common construction site.

The situs picketing bill has had a stormy history. Backed by labor and endorsed by the Eisenhower Administration, it has split the ranks of management and spilled over beyond the construction industry. It has generated fear and confusion.

The bill's opponents include the Chamber of Commerce, National Association of Manufacturers, Associated General Contractors, and National Association of Home Builders.

Among management groups that have endorsed the bill are the Mason Contractors of America, National Electrical Contractors Association, and Painting & Decorating Contractors of America.

Labor in Brief . . .

- **Employment up**—Construction employment rose to 2,593,000 in April, according to the U. S. Labor Department. This is an improvement of 287,000 over the month before, but is still 69,000 less than it was a year ago.
- **Picket lines**—A Wisconsin state court has ruled that state law prohibits unions from fining members who cross picket lines to work during strikes. It upheld a state labor board ruling that such fines coerce and intimidate employees in the enjoyment of their legal rights.
- **Prevailing wages**—The Delaware Senate has tabled a bill to force contractors on public state contracts to pay prevailing wages as set by the Bureau of Labor Statistics of the U. S. Labor Department.
- **Overtime law curbed**—The Washington State Supreme Court has ruled invalid that portion of the state's wage-hour law that calls for time and one-half for more than eight hours of work in one day or more than 40 hours a week. The court said the provision was discriminatory because, unlike federal law, it did not make the weekly total controlling.
- **Contracting-out**—A small group of rank-and-file steelworkers, who hope to unseat their international President David McDonald, claims that Mr. McDonald has failed to protect union members against the contracting-out of maintenance and other work by steel firms. Other criticism includes the allegation that the settlement, which ended the long steel strike, was too cheap.

John J. Murphy is sworn in by his predecessor as . . .

Bates Retires From Union Post

Veteran labor leader Harry Clay Bates has retired as president of the bricklayers international union after more than half a century of distinguished service in the construction industry.

He has been succeeded by the union's former secretary, John J. Murphy, who recently became a vice president of the AFL-CIO Building and Construction Trades Department.

Mr. Bates, now 77, left the post he has held for 25 years for reasons of health. His departure from the bricklayers active command, however, does not spell retirement from the building trades or the labor movement.

Mr. Bates remains president-emeritus of the bricklayers union and will continue as chairman of the union's Board of Trustees. He is still a vice president, Executive Council and Executive Committee member of the AFL-CIO, which he helped to create.

In the eyes of many, Mr. Bates was one of the leading architects of the labor merger, doing more than anyone else, perhaps, to overcome the reluctance of many of the old AFL members to join hands with the CIO in search of labor unity. Since the merger, he has been the building trades' most influential spokesman on the AFL-CIO Executive Council and has served on all the important building trades committees.

A Texan by birth, the warm-hearted and amiable president-emeritus joined the bricklayers in St. Louis at the turn of the century, but returned in 1905 to Dallas, where he began his climb to the top of the union ladder.

He stepped from the presidency of Local 5 to the top post of the Texas State Conference of Bricklayers and, in 1916, assumed the first of the international union posts that led to his appointment as president in 1935.

His contributions to the federal government have been many. They include membership on the Wage Adjustment Board during World War II and on the Wage Stabilization Board during the Korean emergency.

The new president, Mr. Murphy, is a distinguished looking, soft spoken and personable native of Massachusetts. He will be 58 in November.

Starting as a bricklayer apprentice in Worcester in 1924, he later moved into the administrative ranks of the AFL, serving first as regional director of organization for the New England states and then as director of organization for the AFL. He became secretary of the bricklayers international union in 1948.

President Murphy served as labor member on the Regional War Labor Board and War Manpower Commission during World War II and as labor advisor to General Douglas MacArthur and his staff in Tokyo in 1946. He later served as personal representative of AFL President William Green on the Atomic Energy Commission and was a member of the National Wage Stabilization Board and the Construction Industry Stabilization Commission.

Try, Try Again

AFL-CIO starts all over seeking disputes solution

Top officials of the AFL-CIO are turning back the hands of the clock in an effort to find a solution to the jurisdictional conflict between its craft and industrial unions. The problem is closely related to the construction industry's efforts to promote the contract method of construction.

The federation's Executive Council, facing up to four years of failure, has unanimously decided to return to the starting point. This means reactivation of the original solution-searching committee that was jointly established by the Building Trades and Industrial Union departments at the time of the 1955 merger.

During the period since the merger, the AFL-CIO has appointed a number of committees that have tried without success to find a permanent and workable peace plan. Settlements have been found for some of the individual disputes but the basic rivalries remain.

President James Carey of the International Union of Electrical Workers, who suggested dumping the problem back in the lap of the original committee, said such a plan "has a better chance of succeeding at this time." He accused some of the original committee members of not wanting the merger to succeed.

The Industrial Union Department has already named as its new representatives on the committee Walter Reuther, head of the IUD; Mr. Carey; David McDonald of the steelworkers; Paul Phillips of the paper workers; O. A. Knight of the oil workers; and Nicholas Zonarich, co-director of the IUD.

Building trades representatives are expected to include C. J. Haggerty, the new president of the department; Peter Schoemann of the plumbers; and Maurice Hutcheson of the carpenters.

The aim of IUD officials is to negotiate a jurisdictional settlement plan along these lines:

- A representative from each department would investigate and attempt to settle local disputes as they arise.
- If the first step fails, the dispute would go to President Haggerty and Mr. Zonarich.
- If they fail to settle it, a member from each side of the reactivated committee would take over. They would have authority to call in an outside referee to make a binding decision.

The third step involves something that has been a stumbling block in the past—arbitration. There is no assurance that it will now be acceptable.

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Handle isolated from vibration
Special fuel pump carburetion — operates at any angle
Extra heavy-duty timing belt — rugged belt guard
18" Shoe, 12" & 24" shoes optional
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. . . That's the kind of tamping that packs profit into paving jobs. These Stow tampers work faster, more efficiently compacting granular soil in trenching, backfill, sub-bases, foundations. Perfect for black-topped surfaces and for preparing pavement patches, too.

Precision engineered for top performance, the Stow T-18A tamper coordinates the engine stroke with the vibrator stroke to deliver maximum impact (2200 lbs.) to the tamping surface; is designed to propel itself along at speeds *up to 50 feet per minute* . . . while it tamps more than 4500 sq. ft. per hour!

And talk about trouble-free . . .

The Stow Tamper is powered by a Wisconsin easy-start engine . . . equipped with special fuel pump to insure efficient engine performance in all operating positions. And here's a maintenance note: gas tank is mounted underneath the engine for maximum rigidity . . . less wear and tear!

Like we said . . . "That's tamping!"

Try this revolutionary Stow Tamper on your next job. Your local distributor will be glad to arrange an on-the-job demonstration!

Remember Stow T-18A Tamper compacts FASTER, MORE EFFICIENTLY, WITH LESS WEAR AND TEAR.

Call your nearest Distributor or send in the coupon, TODAY! →

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OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.40 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.
SEND COPY TO: Official Proposal Division, Engineering News-Record Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

Bids: June 2, 1960.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS. ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A. M., advanced standard time, which is nine-thirty o'clock A. M., eastern standard time, on the 2nd day of JUNE 1960, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1; G. L. Nickerson, District Engineer, 353 Broadway, Albany 1, New York						
Albany (Rte. 5)	R.C. 60-65	Albany-Schenectady, Pt. 1, S.H. 176 Albany-Schenectady, Pt. 2, S.H. 385	6.86	Asph. Conc.=3.00 Mi. Subsealing Exist. Pavt.=3.86 Mi.	$12,000 Plans $5	$217,000
DISTRICT No. 3, E. E. Towlson, District Engineer, 333 E. Washington Street, Syracuse, New York						
Onondaga (Rte. 5)	R.C. 60-51	Elbridge-Camillus, Pt. 2, S.H. 5143	4.00	Asph. Conc. Type 1A	$13,000 Plans $5	230,000
Tompkins (Rte. 34)	R.C. 60-78	Ithaca-West Danby, Pt. 1, S.H. 5379 Ithaca-West Danby, Pt. 2, S. H. 5567 Spencer-West Danby, Pts. 1 & 2, S.H. 8155	8.69	Asph. Conc. Type 1A	$25,000 Plans $5	438,000
DISTRICT No. 4, B. F. Perry, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Livingston (Rte. 408)	FARC 60-63	Portage-Mt. Morris, Pt. 2, S.H. 5271 Portage-Mt. Morris, Pt. 3, S.H. 5270 Project F-557(10)	9.59	Asph. Conc.=9.53 Mi. Misc. Work=0.06 Mi.	$36,000 Plans $5	642,000
Monroe (Rte. 252)	FARC 60-60	Ballantyne Bridge-Pittsford Pt. 1, S.H. 8443 Ballantyne Bridge-Pittsford Pt. 2B, S.H. 8423 Project F-600(8)	5.95	Asph. Conc.=5.93 Mi. Misc. Work=0.02 Mi.	$22,000 Plans $5	393,000
Monroe (Rte. 261)	FARC 60-57	West Greece-Manitou Beach, S.H. 1281 Project F-508(9); S-584(1)	5.81	Asph. Conc.=5.77 Mi. Misc. Work=0.04 Mi.	$20,000 Plans $5	352,000
Wyoming (Rte. 39)	R.C. 60-68	Castile Village, S.H. 1088; Castile-Castile Center, S.H. 892; Castile Center-Perry Center, S.H. 854	6.20	Asphalt Concrete	$19,000 Plans $5	339,000
DISTRICT No. 5, E. G. H. Youngmann, District Engineer, State Office Bldg., 65 Court Street, Buffalo 2, New York						
Cattaraugus (Rte. 17)	R.C. 60-76	Vandalia-Carrollton, S.H. 5430	2.12	Asph. Conc.=2.08 Mi. Misc. Work=0.04 Mi.	$16,000 Plans $5	298,000
Niagara (Rte. 31)	FARC 60-72	Sanborn-Pekin, S.H. 740; Sanborn-Lockport, S.H. 9094; Shawnee-Cambria, S.H. 729 Project F-709(8)	5.49	Asph. Conc.=5.46 Mi. Misc. Work=0.03 Mi.	$35,000 Plans $5	634,000
Niagara (Rte. 31)	FARC 60-77	Wendts Corners-Gasport, S.H. 8451 Project S-672(2)	3.00	Asphalt Concrete	$26,000 Plans $5	464,000
DISTRICT No. 6, Wm. J. Dennis, District Engineer, State Office Bldg., 30 West Main Street, Hornell, New York						
Steuben (Rte. 53)	R.C. 60-82	Prattsburg-Naples, Pt. 1, S.H. 8296 Prattsburg-Naples, Pt. 2, S.H. 8326	5.87	Asphalt Concrete	$25,000 Plans $5	438,000
DISTRICT No. 7, R. W. Sweet, District Engineer, 444 Van Duzee Street, Watertown, New York						
St. Lawrence (Rte. 56)	R.C. 60-81	Potsdam-Norwood, S.H. 1032	5.37	Asphalt Concrete, Type 1A	$10,000 Plans $5	188,000
Clinton	FASSRC 60-5	Ellenburg-Irona, C.R. 55 (FAS-SS 40-11) Project S-167(4)	6.41	Asph. Conc. Type 1A	$10,000 Plans $5	183,000
Jefferson (Rte. 11)	FARC 60-64	Watertown-Philadelphia, Pt. 1, S.H. 5651 Project F-206(7)	1.35	Asph. Conc. Type 1A	$3,000 Plans $5	55,000
Lewis	FASSRC 60-6	Indian River-Remington Corners, CR 11 (FASS 51-4) Project S-337(3)	10.67	Asph. Conc. Type 1A	$19,000 Plans $5	319,000
DISTRICT No. 9, J. C. Frederick, District Engineer, 71 Frederick Street, Binghamton, New York						
Sullivan (Rte. 52)	R.C. 60-79	Stone Bridge-Falls Mills, S.H. 824 Jeffersonville-Kenoza Lake-Fosterdale, S.H. 795	5.78	Asphalt Concrete	$12,000 Plans $5	221,000
Broome (Rte. 79)	R.C. 60-71	Harpursville-Ouaquaga, S.H. 1106 Harpursville, S.H. 210; Center Village, S.H. 211	4.79	Asphalt Concrete	$10,000 Plans $5	183,000
Chenango (Rte. 41)	R.C. 60-74	Cincinnatus Lake-Long Pond, S.H. 8071 Long Pond-Smithville Flats, S.H. 5260	4.01	Asphalt Concrete	$10,000 Plans $5	181,000
Delaware (Rte. 8)	R.C. 60-61	Deposit-Masonville, S.H. 1888	5.06	Asphalt Concrete	$12,000 Plans $5	213,000
Delaware (Rte. 10)	R.C. 60-75	Bloomville-Hobart, Pt. 2, S.H. 8118	6.60	Asphalt Concrete	$15,000 Plans $5	279,000
Delaware (Rte. 10)	R.C. 60-73	Rockrift-Colchester, S.H. 1271	6.46	Asphalt Concrete	$14,000 Plans $5	247,000
Otsego (Rte. 205)	R.C. 60-69	West Oneonta-Hartwick, Pt. 2, S.H. 8387	5.84	Asphalt Concrete	$13,000 Plans $5	230,000
Schoharie (Rte. 30)	R.C. 60-67	Grand Gorge-Breakabeen, Pt. 2, S.H. 8312 Grand-Gorge-Breakabeen, Pt. 3, S.H. 8270	4.57	Asphalt Concrete	$10,000 Plans $5	176,000
Schoharie (Rte. 30)	R.C. 60-80	Grand Gorge-Breakabeen, Pt. 3, S.H. 8270 Grand Gorge-Breakabeen, Pt. 4, S.H. 8070	4.57	Asphalt Concrete	$10,000 Plans $5	178,000
Sullivan (Rte. 17B)	R.C. 60-70	Falls Mills-Callicoon, S.H. 823	4.80	Asphalt Concrete	$10,000 Plans $5	184,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage), Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bond shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPT. OF PUBLIC WORKS

Bids: June 2, 1960

Demolition of Massena Canal (Alcoa) Power Plant Superstructures and Removal of Canal Bridge Near Massena, St. Lawrence County, New York

POWER AUTHORITY OF THE STATE OF NEW YORK

ADVERTISEMENT FOR PROPOSALS
SPECIFICATION NO. PA-5-11056
ST. LAWRENCE CONTRACT NO. 60

NOTICE TO CONTRACTORS: The Power Authority of the State of New York will receive sealed proposals for Demolition of Massena Canal (Alcoa) Power Plant Superstructures and Removal of Canal Bridge, near Massena, St. Lawrence County, New York, until 10:30 A.M. Eastern Daylight Saving Time, on the 2nd day of June, 1960, at the Authority's Office, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

The principal items of work are:

Schedule No. 1:
Demolition of power plant superstructures of steel and masonry construction, having a total enclosed area of approximately 38,000 square feet. Construction of approximately 600 linear feet of chain link fencing.

Schedule No. 2:
Dismantling and removal of a highway bridge having a truss main span of 408 feet and a plate girder approach span of 63 feet.

All work included in Schedule No. 1 and Schedule No. 2 shall be completed on or before November 30, 1960.

Plans, Specifications and Proposal Forms for the work may be obtained from the Power Authority of the State of New York, at the 18th Floor, the Coliseum Tower, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Ten Dollars ($10.00) per initial set of contract documents and Five Dollars ($5.00) per set for additional sets no part of which will be refunded. Plans, Specifications and Projosal Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and may be inspected by prospective bidders during office hours.

Bids must be made and returned in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the maximum price bid for any bid schedule.

The right is reserved to make award on any one or more of the above schedules, separately or in combination, as fully described in the Proposal, and to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

PA-5-11056

Prequalification: July 15, 1960

Hydroelectric Project Corporacion Autonoma Regional Del Cauca Cali, Colombia

Prequalification July 15, 1960
Prequalification Questionnaire

NOTICE TO CONTRACTORS

It is expected that during the second half of 1960 the Corporacion will request bids from a selected list of prequalified contractors for the construction of the Calima Hydroelectric Project, near Cali. The project will include a rockfill dam with a maximum height of about 100 meters and a volume of about 2,000,000 cubic meters; an 120,000 kw underground powerhouse with a vertical access shaft about 230 meters deep and an inclined access tunnel about 700 meters long; a morning glory spillway; a power intake and gate shaft; a power tunnel and inclined penstock shaft; a tailrace tunnel about 1630 meters long; a diversion tunnel 660 meters long; a tributary diversion tunnel 7 kilometers long; and appurtenant works.

Interested firms that have satisfactorily performed comparable work should apply promptly for prequalification forms to the Corporacion, Apartado Aereo 2366, Cali, Colombia. Completed prequalification forms will be required no later than July 15, 1960. Bids will be received from prequalified bidders only.

OFFICIAL PROPOSALS

Bids: May 26, 1960

Soil Explorations and Foundation Investigations on Interstate Route 505

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m. Advanced Eastern Standard Time, on May 26, 1960, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON INTERSTATE ROUTE 505, SECTIONS 3, 4 and 5 BROAD AVENUE TO HINMANS CORNERS, NEW PROJECT NUMBER 1-81-1(1)0, ITEM 13B, BROOME COUNTY, WHICH CONSTITUTES CONTRACT SPEC. NO. FA-SM-159.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, N. Y.
(b) Mr. Joseph C. Federick, District Engineer, New York State Department of Public Works, 71 Frederick Street, Binghamton, New York.
(c) Mr. William Mende, Principal Building Construction Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50 percent of deposit.
The Engineer's Estimate of cost for this work is $38,850.00.
Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $2,000.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders."
The right is reserved to reject and or all bids.

J. BURCH McMORRAN
SUPERINTENDENT OF PUBLIC WORKS

Bids: May 26, 1960.

Soil Explorations and Foundation Investigations Van Wyck Expressway

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m. Advanced Eastern Standard Time on May 26, 1960, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON VAN WYCK EXPRESSWAY, GRAND CENTRAL PARKWAY INTERCHANGE TO NORTHERN BOULEVARD—WHITESTONE PARKWAY INTERCHANGE, QUEENS COUNTY, WHICH CONSTITUTES CONTRACT SPEC. NO. SM-163.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, N. Y.
(b) Mr. Austin M. Sarr, District Engineer, New York State Department of Public Works, 325 West Main Street, Babylon, Long Island, New York.
(c) Mr. William Mende, Principal Building Construction Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all

OFFICIAL PROPOSALS

other sets in good condition, similar period, will be 50 percent of deposit.
The Engineer's Estimate of cost for this work is $50,085.00.
Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $2,500.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law as set forth in "Instruction to Bidders". The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPERINTENDENT OF PUBLIC WORKS

Bids: June 21, 1960

Cannonsville Dam Contract 465

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A.M., Eastern Daylight Saving Time (10:00 A.M., Eastern Standard Time), on Tuesday, June 21, 1960, for Contract 465, for the construction of the Cannonsville dam, waste weir, and weir, waste, and outlet channels, and the completion of construction of the release water works, together with the plugging of the diversion conduit, construction of a gaging weir, access road and final grading in the vicinity of the dam, installation of equipment and other appurtenant work, all as set forth in the specifications. The Cannonsville dam will be approximately 2,800 feet in length along the top, will have a maximum height of about 175 feet, and will be constructed of earth compacted by rolling. The work is located near the Village of Deposit, Delaware county, New York.

Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained in the Secretary's office, Room 1312, at the above address, upon application in person or by mail, by depositing the sum of $5.00 for each pamphlet. Within 30 days following the award of contract or rejection of bids the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of $4.00 will be made for each other pamphlet returned in acceptable condition. Arrangements will be made whereby prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars apply at the office of the Chief Engineer at the above address.

ARTHUR C. FORD, President, EDWARD C. MAGUIRE, HERBERT M. ROSENBERG, Commissioners; Board of Water Supply; BETTY COHEN, Acting Secretary.

Bids: June 14, 1960

The International Bridge Authority of Michigan

CONTRACT 1—SUBSTRUCTURE
CONTRACT 2—SUPERSTRUCTURE
STEEL FOR THE AMERICAN RIVER SPANS OF THE SAULT STE. MARIE INTERNATIONAL BRIDGE

Sealed proposals for Contract 1 will be received at 10:00 A.M., Eastern Standard Time at the City Hall, Sault Ste. Marie, Michigan for the construction of 12 reinforced Concrete Bridge Piers including earth and rock excavation for foundations, and also including channel rock excavation in the U. S. Power Canal.

Sealed proposals for Contract 2 will be received at 2:00 P.M., Eastern Standard Time at the City Hall, Sault Ste. Marie, Michigan for the Superstructure Steel of one 4-span continuous truss unit with two main spans each of 430 feet and two end spans each of 200 feet, one 3-span continuous girder unit with equal spans of 244 feet and one 4-span continuous girder unit with equal spans of 165 feet.

Plans, Specifications and Proposal Form may be obtained from D. B. Steinman, Consulting Engineer, 117 Liberty Street, New York 6, N. Y., upon application and payment of a fee of $35.00 for each Contract.

Only prequalified U. S. Contractors may bid on these Contracts.

The right is reserved to reject any or all bids.

The International Bridge Authority
of Michigan
James E. Brophy, Chairman
May 13, 1960

OFFICIAL PROPOSALS

District of Columbia—Sewer and Watermain Construction—Dept. of Sanitary Engineering, D. C., May 10, 1960. CONSTRUCTION OF WATERMAINS, STORM AND SANITARY SEWERS, 6TH ST., S. W., BETWEEN "F" ST. AND MARYLAND AV. (Invitation No. C-60150-S), consisting of approx. the following: Storm Sewer Constr: 95 lin. ft. 66", 540 lin. ft. 60" and 320 lin. ft. 54" dia. Reinforced Concrete Culvert Pipe Sewer: 40 lin. ft. 48", 75 lin. ft. 30", 145 lin. ft. 27", 630 lin. ft. 21", 45 lin. ft. 18" and 35 lin. ft. 15" dia. Reinforced Concrete Pipe Sewer; 115 lin. ft. 15" dia. Reinforced Concrete Pipe Catch Basin Connection; 1 Reinforced Concrete Structure; and 370 lin. ft. 1-duct conduit. Sanitary Sewer Constr: 385 lin. ft. 36" dia., 1,015 lin. ft. 30" dia., Reinforced Concrete Culvert Pipe Sewer; 450 lin. ft. 24" dia., 100 lin. ft. 18" dia., 765 lin. ft. 15" dia., and 70 lin. ft. 12" dia. Terra Cotta Pipe Sewer. Watermain Constr.: 1,260 lin. ft. 12" dia., 400 lin. ft. 8" dia., and 45 lin. ft. 6" dia. Cast Iron Watermain. (Wage rates have been predetermined by Labor Dept.) Bid forms, plans and specifications are now available from Supervisor, Bid & Contract Division, Procurement Office, D. C., Room 404, 499 Pa. Ave., N. W., No deposit required. (Phone NA 8-6000, Ext. 2378). SEALED BIDS to be opened 3:00 PM, EDT, May 31, 1960, in Room 424, 499 Pa. Ave., N. W.

District of Columbia, Building Construction —Dept. of Bldgs. & Grounds, April 29, 1960. CONSTRUCTION OF ADDITION TO RUDOLPH ELEMENTARY SCHOOL, Ingraham and 2nd Sts., N.W., Wash., D. C. (Invitation No. C-60162-B). Bid forms, plans and specifications are now available from Supervisor, Bid & Contract Division, Procurement Office, D. C., Rm. 404, 499 Pa. Ave., N.W., upon deposit of a certified check for $50.00 per set, payable to D. C. Treasurer. (Phone NA 8-6000, Ext. 2378). SEALED BIDS to be opened 3:00 PM, EDT, May 27, 1960, in Rm. 424, 499 Pa. Ave., N.W.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5337) will be received at Weslaco, Texas, until 10 a.m., Central Standard Time, June 14, 1960, for furnishing labor and materials for clearing, earthwork, concrete lining, and structures for rehabilitation of K-Lateral—Lower Rio Grande Rehabilitation Project—Mercedes Division, Texas. Location near Weslaco, Texas in Hidalgo County, Texas. Principal items are 200,000 cu. yds., constructing embankments; 3,500 cu. yds., concrete in lateral lining; 6,800 lin. ft., concrete culvert pipe lines; and other work. Completion time 720 days. For particulars, address Bureau of Reclamation, Weslaco, Texas, or Building 53, Denver Federal Center, Denver, Colorado. Floyd E. Dominy, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5338) will be received at White City, Oregon, until 10 a.m., Pacific Standard Time, June 16, 1960, for furnishing labor and materials for Rehabilitation of Oak Street Diversion Dam and Talent Lateral, Station 3+54 to Station 125+68, Rogue River Basin Project. Location near Ashland, Oregon. Principal items are 27,000 cu. yds. of excavation; 1,000 cu. yds. concrete; furnish and install radial gate and hoist; and other work. Completion time 260 days. For particulars, Address Bureau of Reclamation, P. O. Box 386, White City, Oregon; or Building 53, Denver Federal Center, Denver, Colorado. Floyd E. Dominy, Commissioner.

Department of Commerce, Bureau of Public Roads, May 9, 1960. SEALED BIDS will be received at the office of E. L. Tarwater, Division Engineer, Bureau of Public Roads, 1554 Columbia Pike, Arlington 4, Virginia, until 11:00 a.m., D.S.T., JUNE 9, 1960, for Project 1A17, 1A18, George Washington Memorial Parkway, Fairfax County, Virginia. Two Structural Steel Girder Bridges with Concrete Floors, Abutments and Piers over Turkey Run and over Dead Run. Aggregate length: 0.186 mile. The approximate quantities of the more important items are: 6,100 cu. yd. Concrete, 1,139,000 lb. Reinforcement Steel, and 1,685,900 lb. Structural Steel. Minimum wage rates have been fixed as required by law. Plans, specifications and bid forms are available upon request at the address given above. F. W. Cron, Regional Engineer.

OFFICIAL PROPOSALS

Bids: August 1960.

Kingdom of Thailand
Royal Irrigation Department
Bangkok, Thailand

INVITATION FOR BIDS—NO. YSC-3-2

The Royal Irrigation Department of the Kingdom of Thailand hereby invites sealed written bids for furnishing materials and for constructing and installing the 230 KV transmission line from the city of Bangkok to the Bhumiphol Hydroelectric Power Plant, Thailand, for the Yanhee Multipurpose Project, Kingdom of Thailand, in accordance with the Contract Documents for 230 KV Bangkok-Bhumiphol Transmission Line.

The Contract Documents for the 230 KV Bangkok-Bhumiphol Transmission Line will cover the furnishing of all materials and for the complete construction of this 230 KV line. The line will comprise approximately 430 kilometers (267 miles) of single circuit line with two overhead ground wires and using double circuit steel towers (one side strung). A few single circuit towers will be utilized for this line at special locations.

Invitations for Bids will be issued in May, 1960, and will be opened in August, 1960. Copies of Contract Documents, Invitation for Bids—No. YSC-3-2, 230 KV Bangkok-Bhumiphol Transmission Line, may be obtained by qualified Bidders on written request to:

Royal Irrigation Department
Attention: Thai Liaison Engineer
c/o Engineering Consultants, Inc.
1901 South Navajo Street
Denver 23, Colorado

Each request must be accompanied by a check or money order, payable to the Royal Irrigation Department, in the amount of U. S. $25.00 for each copy of the Contract Documents requested. The remittance is nonreturnable.

M. L. Xujati Kambhu
Director General
Royal Irrigation Department
Kingdom of Thailand
Bangkok, Thailand

Bids: August 22, 1960

Tenders For Rapid Transit Cars For Bloor-Danforth-University Subway

TORONTO TRANSIT COMMISSION

Sealed tenders, endorsed "Tenders for Rapid Transit Cars for Operation in University & Yonge Street Subways" will be received by the Toronto Transit Commission at its office, 1900 Yonge Street, Toronto, until one o'clock p.m. Eastern Standard Time, on Monday 22nd day of August, 1960.

The work for which such tenders are invited consists of the construction and delivery of 40 to 50 Rapid Transit passenger motor cars (20 to 25 two-car units) for operation in trains of from two to eight cars, as specified in the Contract Documents.

All tenders must be made upon blank forms of tender as furnished by the Toronto Transit Commission and included in the Contract Documents, and shall be made in accordance with the provisions contained in said documents, and must be accompanied by a marked cheque, payable to the Commission, in the amount of $125,000.

The successful tenderer will be required to furnish, execute and deliver to the Commission a Performance Bond of 100% of the contract sum satisfactory to the Commission in the terms and within the time set out in the Contract Documents.

The Contract Documents, including specifications, are available to tenderers at the office of the Toronto Transit Commission, 1900 Yonge Street, Toronto.

A deposit of $100.00 is required. This deposit is refundable on return of Contract Documents in good condition within 30 calendar days after opening of the tenders.

The Toronto Transit Commission reserves the right to reject any or all tenders without assigning a reason and does not bind itself to accept the lowest or any tender.

No tender may be withdrawn, after the scheduled closing time for receipt of tenders, for at least forty-five (45) calendar days.

H. E. Pettett,
General Secretary.
TORONTO TRANSIT COMMISSION.
Toronto, Ontario.

OFFICIAL PROPOSALS

Bids: November 1, 1960.

Federation of Malaya
Cameron Highlands Scheme

CONTRACT NO. 4A

Tenders are invited for the supply and erection of Mechanical and Electrical Plant for the Habu Power Station to be installed on behalf of the Central Electricity Board, Federation of Malaya.

The Contracts now advertised will comprise two horizontal type Francis waterwheels directly coupled to two 2750 kilowatt 11 kV Alternators, inlet valves, lifting and handling equipment and ancillary equipment.

Tenders are invited only from firms who are prepared to submit complete tenders.

A short precis of the extent of the work for which complete and comprehensive offers are invited may be had on application to Messrs. Preece, Cardew & Rider, 8, 10 & 12 Queen Anne's Gate, London, S.W. 1.

Tender documents, which will be available from 1st June 1960 and returnable by 12 noon on 1st November 1960 may be obtained from the same address on receipt of a payment by cheque for £15 in favour of Preece, Cardew & Rider. This payment will not be refunded.

At a later date offers will be invited for Transformers, Cables and Lighting. Persons interested in such should NOT now apply, but await further advertisements.

The Central Electricity Board do not bind themselves to accept the lowest or any Tender, nor will they be responsible for any costs incurred by Tenderers in making their Tender.

Bids: June 15, 1960

Narrows Bridge—Contract NB-4

TRIBOROUGH BRIDGE AND TUNNEL AUTHORITY

SEALED BIDS WILL BE RECEIVED BY Triborough Bridge and Tunnel Authority at its office, Administration Building, Randall's Island, Manhattan, New York 35, N. Y., as follows:

Until 11 A.M. Wednesday, June 15, 1960

For Narrows Bridge Contract No. NB-4, Furnishing and Delivering Metalwork for Cable Anchorages. The work includes cable anchor bars, structural framing and cable saddle castings. The bid must be accompanied by a deposit in the amount of $150,000.

Plans, specifications and contract documents may be purchased at the office of the Authority for $20.00, which will not be refunded.

Many contractors depend entirely upon the

OFFICIAL PROPOSAL COLUMNS

of

Engineering News-Record

for Opportunities to bid. They might not see your announcements if printed elsewhere

You undoubtedly want their bids on your contracts. Make sure of them on your next contract.

The cost is only $2.40 a line per issue.

EMPLOYMENT OPPORTUNITIES

DISPLAYED RATE:

The advertising rate is $39.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured ⅞" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

JUNE 9TH ISSUE CLOSES MAY 23RD

UNDISPLAYED RATE:

$2.40 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted ads take ½ of above rate.

Box numbers—count as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to Agency Commission.

Send NEW Ads and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36.

SENIOR PROCESS ENGINEERS

Permanent employment with an expanding company. Excellent advancement opportunities for men with at least 10 years experience in process design of petroleum and petro-chemical plants.

Send detailed resume to:
G. VICTOR HOPKINS

ARTHUR G. McKEE & CO.
2300 Chester Ave., Cleveland 1, Ohio

Associate Editor

51-year old business publication in local government field, circulation over 30,000, needs engineer with past experience in municipal service and ability to write on water supply, sewage treatment, street maintenance, governmental administration. Willingness to travel one week a month required. Send resume to

P-4404, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

ENGINEERS

ELECTRICAL and MECHANICAL

Graduate Engineers needed for AEC Project in Nebraska. Positions require substantial experience in industrial installations. Duties include estimating and office engineering. Submit complete resume of experience, qualifications and approximate salary range.

PETER KIEWIT SONS', INC.
P. O. Box 926 Lincoln, Nebraska

AVAILABLE

SANITARY ENGINEER

37 years diversified experience in investigations, reports, design and supervision of construction of water and sewerage systems, and water and sewage treatment plants. Can train and direct personnel, organize and coordinate projects from start to finish.

PW-4399, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

ARCHITECTURAL REPRESENTATIVE

Experienced Manufacturer's Representative, calling on leading Architects and Engineers in New York and New England seeks opportunity to develop specification business for top level Manufacturer of Building or Construction Materials.

RA-4405, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

Need Engineers?

Contact them through this

EMPLOYMENT OPPORTUNITIES section

Immediate Openings

MACHINERY SALES

(Earthmoving — Mining)

Unlimited opportunities at manufacturer level for experienced salesmen.

Earthmoving Division requires man with background in scraper sales (20 yard capacity and up) to contractors.

Also require salesman experienced in Rear Dump sales (30 tons and up) to contractors and mining industry.

All replies treated confidentially. Send resume and salary expected to:

Personnel Director, R. G. LeTOURNEAU, INC., Box 2307, Longview, Texas

SALES ENGINEER

One of our progressive, expanding divisions has an excellent opening in the Chicago area for a man qualified to sell clamshell buckets and grapples.

This division manufactures an extensive line of buckets and grapples for the steel industry, industrial and contracting business.

Qualifications: Prefer M.E. degree with sales experience along these lines. Craneway, crawler, overhead and locomotive type crane experience will be given consideration.

Compensation: Salary—plus expenses—plus fringe benefits to include insurance, pension, savings and vacation. Send complete qualifications and salary desired to

BLAW-KNOX COMPANY
300 Sixth Avenue, Pittsburgh 22, Pa.
J. J. Zimmerman

WANTED

PLANT ENGINEER for opening with large North American mining company for assignment at smelting and refining center in Peru.

Engineering degree, plus 10 years' experience in plant engineering, covering administration, and supervision of maintenance program, utilities, and wide-range of shop facilities. Age to 50, salary commensurate with experience. Transportation, housing, plus other benefits. Reply with full particulars to

P-4363, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

INDUSTRIAL PLANT LAYOUT ENGINEER

experienced in general arrangement, equipment layout, and design of textile and other types of industrial plants. Should be registered engineer with broad knowledge of industrial plant design and construction.

Contact—F. G. Franklin, Chief Engineer, Lyles, Bissett, Carlisle & Wolff, Architects-Engineers, Columbia, South Carolina.

SALES ENGINEER

Excellent opportunity in Eastern Pennsylvania, Maryland and New Jersey sales territory, working out of Philadelphia district office of major chemical corporation for graduate engineer, over 27, desiring sales, promotion and construction work in expanding market. Highway and concrete engineering background desirable for contact with highway departments, contractors and concrete products companies.

Permanent position with excellent opportunity for advancement. Attractive salary, company car and expenses with liberal company sponsored benefits.

Contact Mr. T. D. Williams,

Columbia-Southern Chemical Corporation,
Subsidiary of Pittsburgh Plate Glass Co.,
One Gateway Center,
Pittsburgh 22, Pennsylvania

CONSTRUCTION SUPERINTENDENT

Minimum 15 years experience in chemical plant construction. Graduate civil or mechanical engineer preferred. Must be willing to relocate within United States.

Reply fully and in confidence to:

PAUL S. MONROE
Vice-President

SD PLANTS INCORPORATED
2 Park Avenue
New York 16, N. Y.

EMPLOYMENT OPPORTUNITIES

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

• POSITIONS VACANT

Civil Engineer with municipal experience. Able to register as a Civil Engineer in State of Ohio. Send complete resume of experience and qualifications to P-4320, Engineering News-Record.

Chief Sewer Engineer. Fort Wayne, Indiana. Population—approximately 155,000. Must be or immediately become registered in the State of Indiana as a Professional Engineer. Degree in Civil Engineering or equivalent experience, plus a record of progressively responsible supervisory experience in the design, construction and operation of sewer systems. Salary range: $8000 to $9500. Send complete resume to: Chief Engineer, City Utilities, 425 So. Calhoun Street, Fort Wayne, Indiana.

Sanitary Engineer, experienced in engineering reports, design, specifications for water treatment and sewage disposal plants. Ability to do structural design desirable. Mechanical Engineers, experienced in design of air conditioning systems, service piping for institutional buildings or equipment layout and process piping for industrial plants. Permanent positions in Georgia. Send resume and references to P-4305, Eng. News-Record.

Experienced Concrete Paving Superintendent —Midwest Heavy Construction Firm. Ideal Working Conditions and Many Desirable Fringe Benefits. P-4359, Engineering News-Record.

Estimator—Expanding Philadelphia Contractor has an opening for man thoroughly experienced in competitive public bidding. Top pay and working conditions. Wingate Construction Company, 34 So. 17th Street, Phila., 3, Penna.

Teaching and Research Assistantships are available to qualified students while working for M. S. or PH.D. degree in either solid or fluid mechanics. Write, Chairman, Dept. of Engineering Mechanics, University of Kansas, Lawrence, Kansas.

Construction Engineer, graduate. Heavy industrial construction in Chicago area. Work involves field engineering, production accounting, contracting, estimating and dealing with customers. P-4393, Engineering News-Record.

Specifications Writer. Permanent position available immediately with established Midwestern consulting firm. Architectural or civil engineering degree preferred. Moving expenses paid. 3-week vacation. Salary commensurate with ability. Write P-4413, Engineering News-Record.

Wanted—Young, aggressive and competent Civil Engineers, Instrumentmen and Draftsmen for work in Mid-West. Contact Western Contracting Corporation, Sioux City, Iowa.

Civil Engineer II—$6058-$7722. Graduate engineer with considerable experience in the practice of civil engineering, including some supervisory experience. For complete information, write to Personnel Officer, Room 209, City Hall, Peoria, Illinois.

General Supt.—Experienced C.E. Knowledge of heavy and highway equipment, take full charge Capehart project, grading, storm, sanitary, roads etc., to start at once, salary $10,000.00 year. Send resume to Atlas Excavators, Inc. Union, Mo.

Quarry & Crusher Plant Foreman—Dela. & Md. area. Experience necessary. Response should include asking salary and availability for interview. P-4429, Engineering News-Record.

• SELLING OPPORTUNITY AVAILABLE

Sales Engineer—Fast growing concern needs two graduate engineers, or equivalent construction experience, with sales ability. Permanent positions in South Central United States. Some travel required. Pilot's license definite advantage. Age 28-35. Unusually good opportunity. Submit resume to SW-4432, Engineering News-Record.

• POSITIONS WANTED

Project Manager, construction supervision, Contract Administration. 22 yrs. exp. hvy. constr. major projects U.S. & O.S. PW-4373, Engineering News-Record.

• POSITIONS WANTED

Mech. Engr., married, age 38, 12 years experience, refrigeration, air conditioning, heating, plumbing, distribution systems, 3½ years working overseas on military projects. Desires overseas employment. PW-4383, Engineering News-Record.

Project Manager-General Superintendent— Bid to completion. Engaged in $1,300,000 Thermo Dynamics Lab.; desires to re-locate within 200 miles of central Jersey. Best references. Incl. management responsibility, contract negotiations, labor relations, purchasing, customer relations & negotiations. PW-4349, Engineering News-Record.

Construction man, graduate engineer available for reasonably high level position. 17 years construction experience, 10 of which were spent as head of medium-sized company doing general work with emphasis on engineering type construction. PW-4365, Engineering News-Record.

Civil Engineer, Registered, 41, 15 yrs. varied office exp. Design complete highway except bridges. Design sewers, flood control. Resume available. PW-4360, Eng. News-Record.

General Superintendent or Superintendent Age 37. Desire connection with firm specializing in industrial & commercial construction, vicinity of N. J. Have built mental institutions, missile bases, mass housing, and commercial buildings. Presently employed—need two weeks' notice. PW-4348, Engineering News-Record.

Controller, B.S. in business, age 35—10 yrs. exp. light & heavy const. including Costs, Budgets, Gov. Claims. Bid Procedures, Office Mgr. PW-4302, Engineering News-Record.

Office Manager-Accountant — Experienced heavy construction. Field office or central office NCR machine accounting. Mid-west or West USA. Available. PW-4294, Engineering News-Record.

Secretary—15½ years construction experience. Know secretarial field and some accounting. Desire Southwest or West Coast. Available 30 days. PW-4322, Engineering News-Record.

Field supt. of heavy excavation and drainage, 25 years experience on big projects. PW-4273, Engineering News-Record.

Manager, Assistant or Branch with growing building construction company. Young & experience & would like to grow with company. Cost conscious person who can qualify in any position such as Manager, Estimator, Field Superintendent & Purchasing Agent. Also knows systems & Procedures of Construction Business. PW-4339, Engineering News-Record.

Field-office engr. layout, supervision, take off, etc. municipal, bldg. and heavy const. large or small firms, single. Location open. E. Brown, 600 N. 71st Ave., W. Hollywood, Fla.

Graduate Civil Engineer with five years of experience seeks position in Puerto Rico. Resume on request. PW-4357, Engineering News-Record.

Executive—15 yrs legal-construction experience, Administrator, Mgr., Atty., Govt. Contracts, Claims. PW-4223, Eng. News-Record.

Controller — Office Manager, etc. salary 190.00 per week—consider overseas. PW-4434, Engineering News-Record.

Chief and Administrative Engineer, age 42, 10 years design and supervisory experience in consultant engineering. Graduate and registered professional engineer. PW-4415, Engineering News-Record.

Manufacturers Representative, 14 yrs. construction equipment experience. Will relocate. PW-4408, Engineering News-Record.

Graduate C. E., age 26, EIT Texas, Commissioned officer, Civil Engr. Corps, USNR. Experience in public works and construction with the Seabees. Desire employment in maintenance and construction in the Southwest. PW-4328, Engineering News-Record.

Engineer-Estimator, M. ASCE, 41 BS in CE from Case Tech. 15 years broad background of good construction experience in office and field. Particularly strong at estimating and purchasing. Experience includes bridges, heavy industrial, commercial, and public works projects. Adaptable, responsible, energetic. Location desired, northern Ohio, but will relocate for right party. PW-4389, Engineering News-Record.

• POSITIONS WANTED

Civil Engineer; Married; 30; M. ASCE; B.S.C.E.; M.S.C.E.; 5 years experience heavy construction, 2 years experience university teaching and research (Civil). Speaks the Scandinavian languages, German, some French and Spanish. Foreign only. PW-4397, Engineering News-Record.

Sewer foreman, Italian, middle age, able and fully experienced, would like to join sewer contractor interested in top performance. PW-4425, Engineering News-Record.

Attention General Contractors: June Graduate B. S. in Business, Married. 5 summers with excavating contractor. Resume on request. Wayne R. Nelson, Greenville College, Greenville, Illinois.

Registered Civil Engineer, age 31, desires position with consulting engineer designing housing subdivisions or with contractor doing similar work. Prefer Florida or Mid-Atlantic states. PW-4411, Engineering News-Record.

Civil Engineer, graduate B.S.C.E. Licensed in N. Y. State. Experienced in sewers, highways surveys, design & construction field & office. PW-4428, Engineering News-Record.

Versatile construction engineer—estimator. B.S.C.E. Extensive responsible field experience, power plants, lock and dam, AEC Installations. Prepare complete bid to $4,000,000, highways, bridges, missile bases. Immediately available, prefer general contractor south or west. PW-4417, Engineering News-Record.

Director of Public Works: Experienced in Maintenance, operations, municipal Construction, Administration, City and large scale physical planning for growing areas. BS, MS. Licensed. Middle Atlantic States preferred but not mandatory. PW-4390, Engineering News-Record.

Superintendent or general foreman for small contractor in west. Experienced concrete of all types, slab bridges, drainage. Good work record, best of health. Definitely a company man. Age 40, available now. PW-4416, Engineering News-Record.

Young surveyor/foreman 10 years field experience, both foreman and superintendent & surveyor on excavation jobs. Good references. PW-4412, Engineering News-Record.

Your inquiry will have Special value . . .

If you mention this magazine, when writing advertisers. Naturally, the publisher will appreciate it . . . but, more important, it will identify you as one of the men the advertisers wants to reach with this message . . . and help to make possible enlarged future service to you as a reader.

SEARCHLIGHT SECTION

CLASSIFIED ADVERTISING

BUSINESS OPPORTUNITIES - EQUIPMENT - USED or RESALE

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The advertising rate is $25.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured 7/8 inch vest. on one col., 3 columns—30 in. to a page.

EQUIPMENT WANTED or FOR SALE ADVERTISEMENTS acceptable only in Displayed Style.

UNDISPLAYED RATES

$2.40 a line, min. 3 lines. To figure advance payment count 5 average words as a line.

BOX NUMBERS count as one additional line in undisplayed ads.

DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads.

EQUIPMENT FOR SALE

Barber-Greene 6000# Batch-O-Matic Asphalt Plant
Barber-Greene Finishers
Tandem & 3 axle rollers
Koehring 34-E Dual Drum Concrete Paver
Bulldozers—Caterpillar D8s—15-A Series
Graders—Caterpillar #12s—8 T Series
Shovel—Bucyrus Erie 38-B—with attachments
Shovel—Bucyrus Erie 22-B—with attachments
Truck Crane—Bucyrus Erie—22-B
Gradall—with attachments—one year old.

ALEXANDER CONSTRUCTION CO., INC.
2407 N. Market St. Twin Oaks, Pa.
HU 5-5856

PIPE

Surplus New & Used

FOR SALE, WANTED OR RENT

PIPE — PILING

NEW SUB-STANDARD STEEL PIPE —A252GR2

PRICED FOR QUICK SALE

50,000′	6⅝″ OD X .219″ Wall	DRML
35,000′	7″ OD X 23# & 26#	30′–40′
18,000′	8⅝″ OD X .188″ Wall	34′
35,000′	8⅝″ OD X .250″ Wall	DRML
16,000′	10¾″ OD X 40.5#	DRML
22,000′	12¾″ OD X .250″ Wall	DRML
3,900′	12¾″ OD X .375″ Wall	RML
2,000′	14″ OD X .500″ Wall	RML
10,000′	16″ OD X .250″ Wall	DRML
2,500′	18″ OD X .312″ Wall	DRML
9,000′	20″ OD X .250/.281/ .312/.344″	DRML
4,500′	24″ OD X .312″ Wall	DRML
4,500′	26″ OD X .312/.344″ Wall	DRML

Address all inquiries to
FS-4300—Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

ASSOCIATED PIPE & FITTING CO., INC.

PILING PIPE SHELLS MANDREL FITTINGS	"H" BEARING PILE SLEEVES AND SHOES	K & M ASBESTOS CEMENT PIPE	CULVERTS CIRCLE ARCH SECTIONAL

262 RUTHERFORD BLVD., CLIFTON, N.J. • PR 3-8400

PIPE

90000′ 6⅝″ .156 wall prime X 42 grade B tested 1500# pipe $1.10 foot
33000′ 6⅝″ .188 wall prime X 42 grade B tested 1500# pipe $1.45 foot
33000′ 6⅝″ .149 wall prime grade B tested 1500# pipe $1.05 foot
21000′ 6⅝″ .219 wall prime grade B tested 1500# pipe $1.50 foot
All above pipe located in Long Beach, California.
7000′ 24″ OD 5/16 wall X 42 grade B E. W. prime pipe $6.75 foot
This pipe above is located in Little Rock, Arkansas.
Other sizes 2″ thru 20″ 3/16 and heavier.

DALTON PIPE CO.
3291 Cherry Ave., Long Beach 7, Calif.
Garfield 40431

Call: HYACINTH 7-4900

PIPE, VALVES & FITTINGS

PILING • CULVERTS
ASBESTOS-CEMENT PIPE • ALUMINUM PIPE

ALBERT PIPE SUPPLY CO., Inc.
103 VARICK AVE., BROOKLYN 37, N.Y.

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Exclusive Training Course by mail for top positions. Publishers Manual of Advanced Construction Management. Send postcard for details.

National Schools of Construction
Est. 1952
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STRUCTURAL ENGINEERING

ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty-eighth year.

WILSON *Engineering Corp.*
College House Offices HARVARD SQ. CAMBRIDGE, MASS.

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(1) **Saginaw Trailer** Serial #B 292399 Gypsum Machine with Moyno Pump. Very Good Condition $4000.00
(1) **Essick Plaster Mixer** with Robbins and Myers Moyno Pump with Wisconsin Motor mounted on 1951-1-½ Ton Chevrolet truck. All items in good mechanical condition.....$3000.00

GENERAL ROOFING COMPANY
P.O. Box 271, Washington Pike Bridgeville, Pa.

FOR SALE
Priced to Sell—Real Bargain

1—Used Bucyrus Erie 50 B Steam Crane
1—Used 1½ CY Osgood Steam Crane
150′ of 4′ Round Wood Column Forms

FS-4437, Engineering News-Record
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

GENERAL CONTRACTOR

Nationally known, operating country wide, wants subcontractors for all trades. If you want to be placed on our list, write giving full information as to size, type and geographical coverage of jobs.

M-4353, Engineering News-Record
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

• CONTRACT WORK WANTED

Structural, Mechanical, Electrical—15-man group of licensed engineers (4), designers and draftsmen for all types of structures, heating, air conditioning, steam, water and process piping, power wiring and lighting. Immediately available. CWW-4382, Engineering News-Record.

• BUSINESS OPPORTUNITIES

Engineering and Surveying practice with necessary equipment for sale in fast growing Florida community. BO-4260, Engineering News-Record.

Engineering and surveying practice with equipment for sale in north central Ohio. Owner selling because of health. BO-4431, Engineering News-Record.

DON'T FORGET THE BOX NUMBER

ESTIMATORS LTD., INC.

Professional Construction Estimators
Accurate Confidential
World Wide
Main Office
347 E. Market St., Long Beach 5, Calif.
Phone NEvada 6-5033

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We are seeking a

Joint Venture Contractor ASSOCIATE

for GOOD Money Making Foreign Projects

ROADS—BRIDGES—RAILROADS
MUNICIPAL—HARBOUR—DAMS
POWER—IRRIGATION—INDUSTRIAL

Must have late model equipment in good condition and AA-1 Dun & Bradstreet Rating, small Capital requirements. We have the GOOD contacts.

JACQUES J. YARED & COMPANY
P.O. Box 722 Station "B"
Montreal, Quebec

U. S. Army Telephones EE-8 fully reconditioned. Suitable for intercommunication between 2 or more points. $35.00 for 2 telephones, including 100 ft. of wire and batteries. Additional wire 1¢ per ft. or $25.00 per mile. Write for free list on telephones. All shipments F.O.B. Simpson, Pa.

TELEPHONE ENGINEERING CO.
Dept. ENR-40 **Simpson, Pa.**

CONCRETE PAVING EQUIPMENT

FOR SALE

1—Koehring 34-E Dual Drum Paver, Diesel powered w/ latest accessories.
3350′—17″ x 17″ x ¼″ x 10′ Heavy Duty Airport Forms
1—Heltzel 3 compartment Aggregate Bin w/ dual weighing hoppers, 100 Ton
1—Heltzel 300 Bbl. Bulk Cement Plant w/ dual weighing hoppers and w/ 150 Ton Elevator.

W. L. JOHNSON CONSTRUCTION COMPANY AND ASSOCIATES
P. O. Box 6668, Bexley Station
Columbus 9, Ohio **Phone: TEmple 3-1327.**

A LARGE AUCTION
LATE CONSTRUCTION EQUIPMENT
THURSDAY, JUNE 16, 9 AM, (EDT), MANCHESTER, NEW HAMPSHIRE

LOCATION: The yard of the Manchester Sand, Gravel & Cement Co., Inc. at Hookset, N. H. 6 mi. North of Manchester, N. H. or 60 mi. North of Boston, Mass.

NOTICE: The Manchester Sand, Gravel & Cement Co., Inc. has quit the road, bridge and paving business. The equipment formerly used in the above operations is being sold by Mr. Parker H. Rice, Trustee. This is exceptionally well maintained equipment, all gone-through for the coming working season.

EACH PIECE POSITIVELY SELLS TO THE HIGHEST BIDDER Without Limit, Minimum or Reservation!

SHOVELS—GRADALLS—MOTOCRANE

2 Northwest 80D Shovels, S/Nos. 20613-19550B & 18595-17849B, both very good; Northwest Drag Boom for 80D; Lorain 80J Shovel, S/N 21513, good; Lorain Drag Boom for 80J; 2 Northwest 25 Shovels, S/Nos. 16186 & 11852, both good; Northwest Backhoe Front, for 25; 4 Gradalls, S/Nos. NP-38240, 40127, 32339 & 29693, all very good; Lorain 530W Moto-Crane, S/N 29172, very good; Northwest Drag Boom & Backhoe Front for model 6; Buckets.

TRACTORS—LOADERS

Cat D-9 S/N 19A-1621, with Ripper & 9U dozer, very good; Cat D-9, S/N 19A-1245, w/ 9S dozer, very good; Cat D-8 (series H), S/N 36A-961, with 8U dozer, very good; 3 Cat D-8's, all 14A's, all w/ 8U dozers, all very good; Cat D-8, 15A, w/ Ripper & dozer, very good; 5 Cat D-7's, late 17A's w/ 7S dozers, all very good; Cat D-4, late 7U w/ dozer; 2 John Deere 440IC crawlers w/ dozers; Hough HM Payloader, S/N 92070, good; 3 IHC & Fordson Loader-Tractors; 2 AC & IHC Wheel Tractors.

CRUSHING EQUIPMENT

Telsmith Portable Primary Crusher Plant, S/N 598, w/ 25x36 Jaw, Chain Apron Feeder, GMC 6031C Diesel Power, all conveyors, very good; Telsmith Model 9C Portable Screening & Loading Plant, S/N 554, with 10x36 Jaw, 30x18 dbl Rolls, 4x10 Screen, GMC 6031C Diesel Power, all conveyors, very good; Telsmith Model 36S Gyrosphere Crushing & Screening Portable Plant, S/N 599, w/ 4x12 Screen, all conveyors, GMC 6240G Diesel Power & 50 KW Generator, elec. motors, all very good; 2 Telsmith 4x8 Screens.

GRADERS—MOTOR SCRAPERS EUCLID END DUMPS

8 Euclid 87FD & 49FD End Dumps, S/Nos. 10157 to 15642, all good; 7 Cat DW-21 Motor Scrapers, S/Nos. 86E-2797 to 69C-1744, all in very good condition; Cat 70 Scraper, good; Cat 14 Grader, S/N 64C-137, all equip. very good; 2 Cat 12 Graders, S/Nos. 70D-2520 & 8T-20242, w/ Preco Blade Controls, both very good; Adams 660 & 610 Graders, both good.

ASPHALT EQUIP.—ROLLERS

3 Barber-Greene 879A Pavers, S/Nos. 236566, 23555 & 18253, all very good; Seaman DS47-43 Self-Propelled Pulvi-Mixer, good; 2 Etnyre Curb Machines; 3 Buffalo-Springfield 3-Axle Rollers, Models KX-25-E, KX-25-D & KX-25, good to very good; 2 Galion "Chief" Rollers, S/Nos. CRG-41171 & R-20555, very good & good; Galion TC8-12G & T8G Rollers; 3 Moto & Essick Rollers; Jackson MC-130A Multiple-Compactor; 2 Bros SP-54 Self-Propelled Rollers, very good; Bros 100 Ton Roll-O-Pactor; Pull Rollers.

COMPRESSORS—MISC.

Ingersoll-Rand 600 Compressor, very good; 2 I-R 105 Comps; 4 Lindsay 80 & 55 cfm Compressors; Many Pumps; Welders; Lite Plants; Heaters; Vibrators; Mixers; Drills; Air Tools; Saws; Pipe Equip; Engineering Equip; Many Other Items.

TRUCKS—TRAILERS

2 Alemite Grease Rigs, in Van Trucks; Sterling-White HB-2755D Diesel Tractor, very good; 3 Mack LFT & A50T Tractors; Rogers 60 Ton Lowboy, very good; Martin 32 Ton Lowboy, very good; Highway 30' Rack Trailer; 7 Fruehauf & Trailmobile Van Trailers; 5 3000 gal. Tank Trailers; 3 Office Trailers; 15 Dump, Tank, Flat & misc. Trucks; 20 Pickups; 5 Autos; Others.

Write—Wire—Call Auctioneers for full list.

TERMS: FINANCING AVAILABLE!!

Or complete payment sale day.

Former Property Of:

Manchester Sand, Gravel & Cement Co., Inc.
(Parker H. Rice, Trustee)
Manchester, N. H. Phone NA 4-4301

FORKE BROTHERS
the Auctioneers

321 Sharp Bldg. **Lincoln, Nebraska** HEmlock 2-1045

— EQUIPMENT AUCTION LEADERSHIP SINCE 1921 —

PILE DRIVING EQUIPMENT

VULCAN AND McKIERNAN-TERRY
Steam Pile Hammers and Extractors

• DROP HAMMERS • DRIVING CAPS • HOISTS AND BOILERS
• STEEL LEADS • PILE DRIVER HOSE • STEEL SHEET PILING

CONMACO, INC.

DRexel 1-3930
820A KANSAS AVE.,
KANSAS CITY, KANS.

PORTABLE CRUSHING PLANT

Cedarapids 1836 Twin Jaw Roller Bearing Portable Crushing Plant, complete with drives, 30" x 27' Channel Frame under Crusher Conveyor, 30" x 8' reciprocating Feeder with adjustable throw eccentric clutch, stationary grizzly bypass chute, hopper, feeder supports, conveyor supports, walkway platform with expanded metal flooring for Crusher, powered by Model 6038C G. M. Diesel Engine, 12" truck frame and Cedarapids tandem rear axle assembly with oscillating beams, air brakes, wheels, 8—9.00 x 20—12 ply Goodrich tires. Excellent condition, used very little. Savings to 40% of new unit price. Available immediately. Subject to prior sale or disposition.

L. B. SMITH, INC.

357 W. Fayette St. Syracuse, N. Y.

Phone: GRanite 5-2196

RAILS-TIES
TRACK ACCESSORIES

SEARCHLIGHT Equipment Locating Service

This service is aimed at helping you, the reader of "SEARCHLIGHT", to locate Surplus new and used Engineering and Construction equipment *not currently advertised.* (This service is for USER-BUYERS only). No charge or obligation.

How to use: Check the dealer ads to see if what you want is not *currently* advertised. If not, send us the specifications of the equipment wanted on the coupon below, or on your own company letterhead to:

Searchlight Equipment Locating Service
c/o ENGINEERING NEWS-RECORD
P. O. Box 12, N. Y. 36, N. Y.

Your requirements will be brought promptly to the attention of the equipment dealers advertising in this section. You will receive replies directly from them.

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Cheerful News on Steel

MORE ECONOMICAL STEEL CONSTRUCTION is promised as a result of the development of two new specifications (ENR May 12, p. 24). One permits higher stresses for connections made with high-strength bolts in full bearing. The second, and more far-reaching, presents requirements for a weldable, higher-strength structural steel.

The new specification, "A36—For Structural Steel," which may receive official American Society for Testing Materials approval by midsummer, calls for controlled chemistry and a 10% increase in yield point compared with A7 steel. The new steel may be used instead of A7 at higher stresses and, in many cases, instead of A373 steel where weldability is important. The old A7 specification will be retained because of the demand for it by certain fabricators needing its ductility, such as railroad car manufacturers.

The A7 specification has been in use since 1900. Until 1934, it applied to steel for bridges and was paralleled by A9, for steel for buildings—both with tensile strengths in the 55,000 to 65,000-psi range and 30,000-psi minimum yield point. (A separate specification was written for rivet steel in 1932.) In 1934, A7 and A9 were revised to increase tensile strength to a 60,000-72,000-psi range and yield point to 33,000 psi. At that time, the basic design stress was raised from 18,000, which the American Institute of Steel Construction had recommended since 1923, to 20,000 psi. Finally, A7 and A9 were combined in 1939 into a single A7 specification.

Producers and consumers have been loathe to change A7 because of the excellent results obtained with it over the years and because steels with higher yield points are more costly to produce and fabricate. Furthermore, yield strength is closely related to chemistry; the higher the yield point, the more carbon or manganese, either of which may affect ductility, weldability and toughness adversely. Manganese has a smaller effect on these properties than carbon, but costs more. The new A36 specification, like A373, permits manganese up to a certain percentage, depending on thickness.

Some steel producers already have been making A7 steel with the higher yield point and satisfactory all-around characteristics by controlling chemistry and grain growth. But until now they have been unwilling to guarantee both the minimum yield point at the higher level and the maximum carbon content without an appreciable increase in price. Competition and consumer demand for a weldable, higher-strength steel apparently have been great enough in the last two years to spur the new development.

Cost of A36 steel has not yet been announced. But if an increase over that for A7 steel is necessary, it probably will be less than 10%. Since the AISC plans a 10% increase in basic allowable stresses for A36 over those for A7 and A373 steels, the new steel should be more economical to use than either of those steels. In these days of rising costs that is a cheerful prospect.

At the End of Round One

ROUND ONE in the congressional highway hearings unquestionably went to the investigators. The committee hit hard into irregularities in the construction of 13.8 miles of federal-aid highways in Tulsa, Okla. Various highway department employees testified to apparent evasion of specifications, irregularities in bookkeeping and falsifications of tests. One contractor admitted to collusion and price fixing. Another contractor and an ex-highway commissioner took the Fifth Amendment.

Such testimony is shocking. Among the dire implications for the highway construction industry could be the undermining of legislative and congressional support for the entire program.

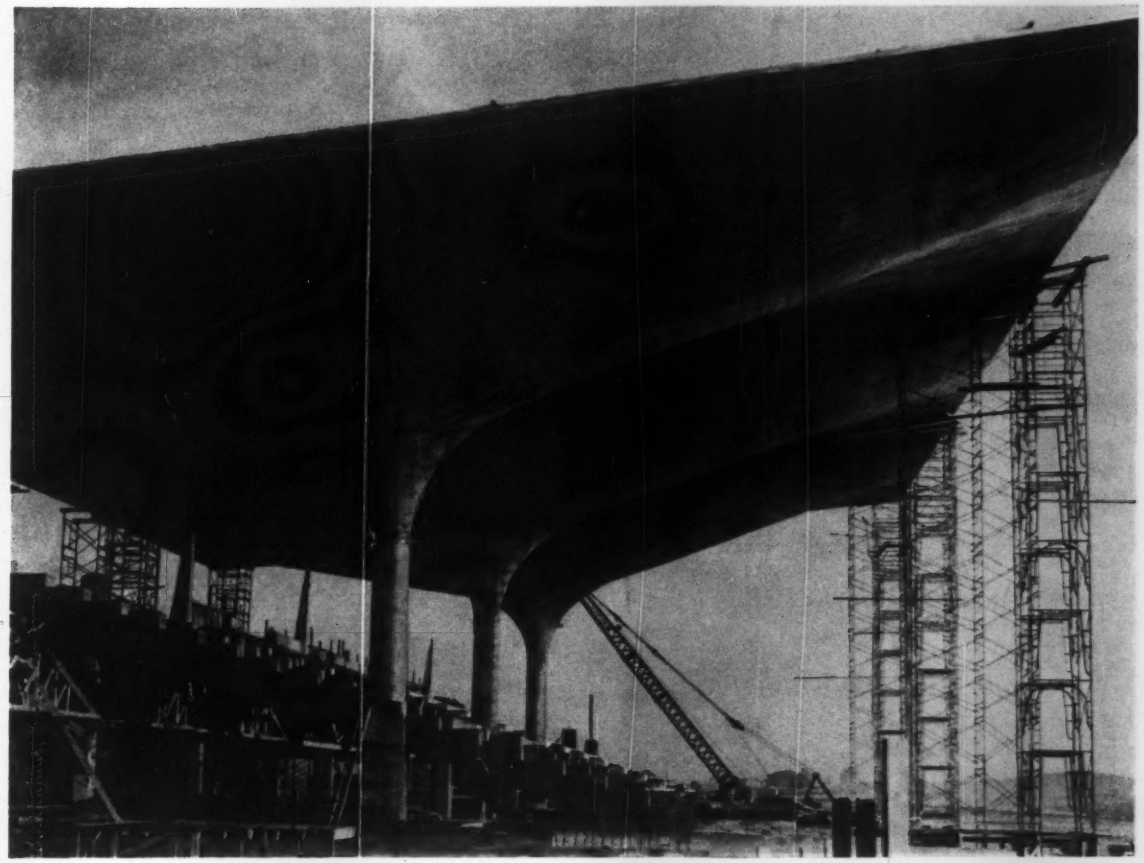
Obviously the Tulsa job is only a tiny piece of the 40,000-mile multi-billion-dollar program. Obviously, too, the skullduggery revealed by the testimony is not typical, for the overwhelming majority of highway officials, engineers and builders are honest and conscientious in their conduct of public work. Nevertheless, testimony pointed to a degree of carelessness in the expenditure of public funds that cannot—and should not—be tolerated.

Safeguards existed against the events that took place in Tulsa. Sufficient for the large majority of cases, they apparently are not good enough for all situations. Therefore, the Bureau of Public Roads, as the representative of the federal government in the program, must extend and tighten its supervision of material and construction controls carried out by the states.

This need not disturb the traditional state-federal relationship in the highway program—based upon mutual trust and understanding—but certainly BPR must not allow itself to be hoodwinked, as it apparently was in Tulsa. Mutual trust and understanding are fine things, but not naivete and childlike innocence. In this connection, AASHO leaders have moved quickly to plug a gap in previous policies of that key group. Long overdue but now under way are plans for development of AASHO policies (similar to those on geometric design, bridge design, maintenance, and so on) covering quality and quantity, job control and administration.

All roadbuilders who have read of the hearings in ENR's May 12 issue will want to support the commendable effort afoot to keep public opinion from being based solely on the bad things it hears of this program. And any who might have read of Round One with anything less than a clear conscience might want to do even more than that lest they find themselves in the ring fighting flat-footed in rounds to come.

Owner: Scioto Downs, Inc., Columbus, Ohio; Architect: Kellam & Foley, Columbus, Ohio; Structural Engineer: Gensert & Williams, Cleveland, Ohio; General Contractor: Sheaf Construction Co., Columbus, Ohio; Concrete Supplier: Anderson Concrete Corp., Columbus, Ohio.



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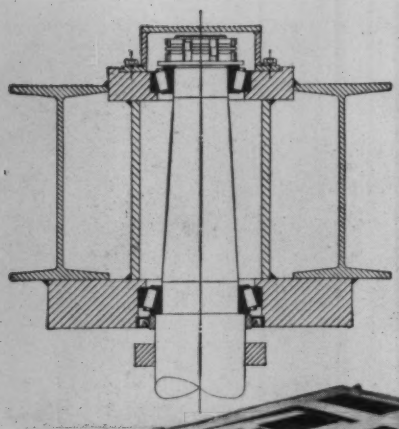

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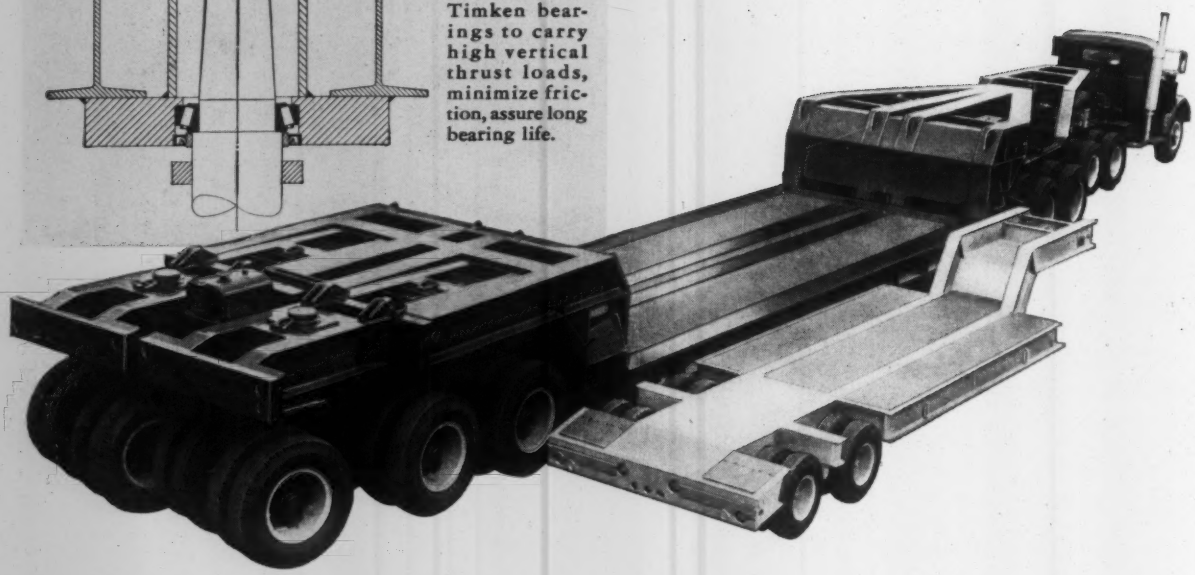

Rogers trailer rolls 200 tons, tires track perfectly ...with wheels and kingpins on Timken® bearings

It's a long 93 feet from truck bumper to end of trailer. And it has a huge 200-ton capacity—mounts forty—12 x 24—14 ply tires. You can see how this Rogers Bros. Corp. D-3-W200D trailer compares with its 25-ton "baby brother" model in the picture above. Big as it is, it rolls easily with 20 dual wheels on Timken® tapered roller bearings. Tires in the detachable, oscillating rear assemblies, track with the trailer—with Timken bearings providing a rigid but friction-free mounting for the vertical caster shafts.

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1) *Practically eliminate friction.* Because Timken bearings have true rolling motion they roll smoothly, retain their precision longer.

2) *Assure maximum capacity, long bearing life.* The tapered design enables Timken bearings to take any combination of heavy radial and thrust loads. Full line contact between rollers and races gives *extra* load-carrying capacity. And special quality control in their manufacture further assures long bearing life.

When you build or buy a machine equipped with Timken bearings, you receive *extra* value. That's because of Timken Company leadership in tapered roller bearing design and manufacture. And Timken salesmen are graduate engineers trained to give you the finest technical bearing service available.

Advantages you buy with Timken bearings: *1) Quality you can take for granted. 2) Service you can't get anywhere else. 3) The best-known name in bearings. 4) The pace setter in lower bearing costs.* The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits.*

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